

ANNUAL MANAGEMENT REPORT YUKON AREA, 1989

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PREFACE

This report presents current and historical information concerning the management of commercial and subsistence fisheries in the Yukon Area. Data from a number of research projects are included in this report; complete documentation of these projects and results are or will be presented in separate reports. Data presented in this report supersedes information found in previous management reports. An attempt has been made to correct errors in previous reports and previously unrecorded data have been incorporated into this report. The report is organized into the following major sections:

1. Area Introduction. This section presents a description of the area, fishery resources, fisheries and management practices.
2. Area Report, 1989. This section presents a comprehensive report of the current year and makes comparisons with previous years.

In order to facilitate use of this report, tabular data has been separated into current year tables and appendix tables where annual comparisons are made.

The following is an explanation of how commercial fishing effort and catch per unit effort data, presented throughout this report, have been derived:

Boat (or fisherman) hours have been computed, arbitrarily assuming that if a fishing boat delivers in any fishing period, it fished the entire period for as many hours as were open to commercial fishing.

Catch per fisherman (or boat) hour is obtained by dividing the total fishermen hours into the catch for the corresponding period of time.

Total fishermen (or boats) is the total number of fishermen making deliveries, regardless of how many deliveries were made or days fished during a particular "season". There are a number of fishermen who deliver only once or twice during the entire season. "Total days fished" is the total number of hours open for commercial fishing during the season divided by 24.

Historic catch trends of total utilization are documented in Appendix Table 1. Annual Management reports prior to 1987 identify the catch as being taken for commercial or subsistence use, as well as total utilization.

AREA INTRODUCTION

Description of Area and District Boundaries

The Yukon management area includes all waters of the Yukon River and its tributary streams in Alaska and all coastal waters from Canal Point Light near Cape Stephens southward to Naskonat Peninsula (Figure 7). The Yukon River is the largest river in Alaska, draining approximately 35 percent of the state, and is the fifth largest drainage in North America (Figure 1). The river originates in British Columbia, Canada, within 30 miles of the Gulf of Alaska and flows over 2,300 miles to its mouth on the Bering Sea, draining an area of approximately 330,000 square miles. With the possible exception of a few fish taken at the mouth or adjacent coastal villages, only salmon of Yukon River origin are harvested in this Area.

There are approximately 10,000-15,000 rural residents in the Alaskan portion of the drainage, the majority of whom reside in 43 small villages scattered along the coast and major river systems. Nearly all of these people are dependent to varying degrees on fish and game resources for their livelihood.

The Alaskan commercial salmon fishery occurs along 1,200 miles of the mainstem Yukon River and the lower 200 miles of the Tanana River. The present district boundaries were originally established in 1961 and redefined in 1962, 1974, and 1978. The commercial fishing area is divided into six districts for management and regulatory purposes (Figure 7). The Lower Yukon Area includes the coastal waters of the area and that portion of the drainage from the mouth to Old Paradise Village, river mile 301 (lower three districts). The Upper Yukon Area is that portion of the drainage upstream of Old Paradise Village to the U.S./Canada Border including the Tanana River (upper three districts). The districts are further subdivided into 10 subdistricts and 25 statistical areas for management purposes. Figures 8, 9, and 10 show the statistical areas for the lower three districts. Figures 11, 12, 13, and 14 show the statistical areas for the upper three districts. Figures 16-20 show closed waters areas. Yukon River mileages are listed in Table 2.

Fishery Resources

Five species of Pacific salmon are found in the Yukon River drainage (Figure 1) with chum salmon (*Oncorhynchus keta*) being the most abundant. It is estimated that chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*), pink (*Oncorhynchus gorbuscha*), and sockeye (*Oncorhynchus nerka*) salmon follow in order of abundance.

Chum salmon are found throughout the Yukon River drainage. Summer and fall chum salmon are two distinct runs of chum salmon which enter the Yukon River. Summer chum salmon are chiefly characterized by: earlier run timing (early June-mid July), rapid maturation in freshwater, smaller size (average 6-7 pounds), and larger population. Summer chum salmon spawn primarily in run-off streams in the lower 500 miles of the drainage and in the Tanana River system (Figures 2, 3, and 4). Fall chum salmon are mainly distinguished by: later run timing (mid July-early September), robust body shape and bright silvery appearance, larger

size (average 7-8 pounds) and smaller population. Fall chum salmon spawn in the upper portion of the drainage in streams which are spring fed, usually remaining ice-free during the winter. Major fall chum salmon spawning areas include the Tanana, Chandalar and Porcupine River systems and also various streams in the Yukon Territory including the mainstem Yukon River (Figures 4, 5, and 6).

Chinook salmon of the Yukon River are the largest species ranging from 2-90 pounds and averaging 20-25 pounds (sampled from the commercial fishery, large mesh gill nets). Spawning populations of chinook salmon have been documented in the Archuelinguk River located approximately 80 miles from the mouth of the Yukon River and as far upstream as the headwaters of the drainage in the Yukon Territory of Canada, nearly 2,000 miles from the mouth (Figures 2-6). Chinook salmon enter the mouth of the Yukon River soon after ice breakup during late May to early June and continue through mid-July.

Coho salmon enter the Yukon River during late July through mid-September, average about seven pounds in weight and spawn discontinuously throughout the drainage. The major coho salmon spawning concentrations documented to date occur in tributaries of the upper Tanana River drainage (Figure 4).

Pink salmon enter the lower river during late June to mid-July, average approximately 3 pounds in weight and essentially spawn in the lower portion of the drainage (downstream of the village of Grayling) (Figure 2). Pink salmon have been caught in the mainstem Yukon River upstream as far as Ruby (river mile 601). In recent years large runs of pink salmon have occurred during even numbered years i.e. 1984, 1986, and 1988.

Sockeye salmon are uncommon in the Yukon River and only a few individual salmon are caught each year. Sockeye salmon have been reported in the main Yukon River upstream to Rampart (mile 763). There have been reports of sockeye salmon spawning areas being located along the Innoko River drainage and possibly in the Anvik River.

Pacific herring (Clupea pallasii) are found in Hooper Bay, Kokechik Bay and Scammon Bay (Figure 21). Spawning populations occur primarily in the Cape Romanzof area (Kokechik Bay and Scammon Bay) where suitable spawning habitat consisting of rocky beaches and rockweed (*Fucus*) is available. Spawning usually occurs from mid-May through mid-June.

Other species common to the freshwater and or coastal marine habitats are listed in Table 1.

Water Quality

Water quality and spawning habitats in the area have been largely preserved in their original condition. Pollution, logging, dam construction and mining activities, except in a few locations, have been to date minimal or nonexistent. It remains to be seen what impact recent oil development activity will have on water quality and fishery resources in the area.

Salmon Fishery History and Description

In excess of one million salmon, mainly chum salmon were taken for subsistence use in some years during the early 1900's, even as recently as 1940 (Appendix Table 1). The first recorded commercial salmon harvest in the drainage occurred in 1903 when 70,000 pounds of chinook and fall chum salmon were taken in Yukon Territory, Canada. The first recorded commercial salmon harvest in the Alaskan portion of the Yukon drainage occurred in 1918. Relatively large catches of chinook, chum, and coho salmon were made during the first four years of the fishery. The majority of the catch was taken outside of the river mouth since catch restrictions were imposed within the mouth of the river. The early commercial fishery met opposition and was closed during 1925-1931 because of the existence of a large subsistence fishery. Commercial fishing for chinook salmon was resumed at a much lower level in 1932 and a fishery has occurred annually since then. Commercial catches of chum and/or coho occurred during 1918-1921, 1952-1954, 1956 and since 1961.

Alaskan Subsistence Utilization

Subsistence fishermen operate gill nets largely in the main rivers and, to a lesser extent, in the coastal marine waters, capturing primarily salmon, whitefish and sheefish. Fish wheels take considerable numbers of salmon in the upper Yukon and Tanana Rivers. Beach seines are occasionally used near spawning grounds to catch schooling or spawning salmon or other species of fish. Traps and fish weirs of various designs are also used, mainly in the fall and winter months, to capture whitefish, blackfish and burbot. Sheefish, pike, char and "tomcod" (saffron cod) are frequently taken through the ice by hand lines. Dip nets are used in late May to early June to take smelt in the delta area and in late October to early November to take lamprey in the main Yukon River downstream of Grayling.

Subsistence fisheries which target on non-salmon species such as pike, sheefish and whitefish are inadequately documented and their overall significance is not well known. It is thought, however, that residents of the Upper Yukon Area are much less dependent on these miscellaneous species than are their downriver counterparts.

There is usually little intentional wastage of the fish taken for subsistence purposes. The major portion is sun dried or smoked for later consumption while the head and viscera may be fed to sled dogs. Wet weather may cause wastage during the process of attempting to dry fish.

Comprehensive annual surveys of the subsistence salmon fishery were initiated by the Department in 1961. Survey methodology and technique has varied from year to year which influences subsistence harvest estimates, however, it is felt that estimates accurately reflect harvest trends. Catch data from the Canadian portion of the drainage has been supplied by personnel of Government of Canada, Department of Fisheries and Oceans, (DFO) (Whitehorse office) since 1962.

Subsistence salmon catch data in Alaska have been collected through the use of personal interviews, catch calendars (on which fishermen record daily catches), and mail out questionnaires. Beginning in the early 1970's, subsistence fishing permit catch information has been available for three sections of the Upper Yukon Area. These permit areas include the area near the haul road bridge, the upper portion of District 5, and the Tanana River near Fairbanks. Since 1988, subsistence permits have been required for the entire Tanana River drainage.

Generally, catch calendars are mailed out prior to the fishing season in late May. Post-season surveys consist of personal interviews conducted in a majority of villages in the drainage, and a follow up mail questionnaire to fishermen that are not interviewed. Commercial Fisheries Division staff conducted all subsistence surveys except for 1988. Subsistence Division staff conducted the 1988 survey. The objective of having Subsistence Division staff conduct the 1988 survey was to improve survey data collection and analysis.

The basic methodology developed by Subsistence Division in 1988, was to identify all households in each community. Community household lists were formulated by utilizing prior year survey lists of fishing families, village census information, and interviews with key individuals. The updated community household lists were stratified by "usually fish" and "usually not fish" households. Substantially more fishing households were identified than on fishing family lists used prior to 1988. However, historically, survey lists evaluated households in a broader sense (family units working together to harvest and process salmon), therefore, there is no direct correlation between fishing family and fishing household.

Subsistence Division improved the format of catch calendars from previous years. Since 1988, unique calendars have been utilized for three broad geographical areas of the Yukon River drainage (lower, middle, and upper), rather than one generic calendar. Unique calendars for each area allow the inclusion of only those species harvested, only months during which salmon fishing actually occurs, and for species to be identified by common and local names.

Additionally, Subsistence Division developed maps for each community based on aerial photographs, published maps by the Department of Community and Regional Affairs, and the Alaska Village Electrical Cooperative to assist field workers in locating households for personal interviews. These maps are updated each year.

For all years, subsistence catch data have been expanded for unknown fishing families or households on a community basis. Expanded community harvests are then summed for district and total drainage estimates.

Historically, subsistence salmon harvests were very large. About 1930, the airplane began replacing the sled dog as mail and supply carrier, starting a gradual reduction in subsistence harvests. During the early to mid 1960's, there was an increasing use of snow machines which replaced sled dogs faster than did the airplane. Subsistence salmon catches declined through the 1970's as increased welfare payments and employment opportunities, including commercial fishing activities, became available to rural residents. Declines in subsistence catch levels through the 1970's varied by species. The reduction was not

necessarily related to fish abundance, but likely reflected decreases in effort and dependence due to a changing way of life. Beginning in the early 1980's, due to a renewed interest in sled dog racing, the number of dogs per family has increased in some portions of the drainage. Coincidentally, there has been an increase in the subsistence salmon harvest. In addition, the human population along the river is increasing, which may relate to increased subsistence harvests.

Reflecting the above changes in subsistence use patterns, the harvest of salmon other than chinook (primarily chum salmon) averaged 416,600 fish during 1961-1965 (reference Yukon Area Annual Management Report, 1985), and then decreased to an average of 209,600 fish during the period 1966-1973. More recently, subsistence catches have increased, averaging 364,721 fish during 1974-1983.

Subsistence catches of chinook salmon, which are utilized mainly for human consumption, remained relatively constant during the period 1961-1977, generally averaging 15,000-25,000 per year (reference Yukon Area Annual Management Report, 1985). During the 1978-1988 period, chinook salmon catches have increased substantially, averaging approximately 39,900 fish per year (Appendix Table 28).

Subsistence fishing for summer chum salmon declined following the 1966 season. Harvests prior to 1966 were over 300,000 fish annually, while during the period from 1966-1980 harvests were generally under 200,000 fish annually. Documented subsistence catches since 1981 suggest a trend of increasing utilization (Appendix Table 29).

The Upper Yukon and Tanana River subsistence fishery has differed from that in the Lower Yukon due to the limited nature of the Upper Yukon Area commercial fishery and the subsistence use of resources by urban residents. The majority of the subsistence salmon catches are taken in the Upper Yukon River Area which is illustrated by the catch data presented in Appendix Tables 27-31. In that portion of the Yukon River drainage upstream of the mouth of the Koyukuk River, fall chum salmon are of more importance for subsistence use than summer chum salmon. It is estimated that fall chums comprise 60-75% of the total subsistence harvest in this area.

The difficulty in estimating the summer chum salmon subsistence harvest in District 4 has been discussed in previous annual management reports. Commercial fishermen in District 4 have only a very limited market for summer chum salmon. As a result, fishermen extract and sell roe from their catch and retain the carcasses for subsistence use. During the 1980-1985 period, it is likely that many fishermen have reported this portion of their commercial harvest as subsistence fish. In fact, it is probable that the unmarketable commercial product has simply replaced a large portion of the subsistence harvest in this area. Subsistence surveys and personal interviews from 1986 through 1989 were conducted so as to estimate the number of summer chum salmon taken by commercial related activities and those taken by standard subsistence fishing means. The proportion of the summer chum harvest taken unrelated to commercial fishing in 1986 was used to adjust District 4 subsistence and commercial harvest estimates for 1980 through 1985 in Appendix Table 29. This was done to avoid double counting.

It should be noted that the practice of keeping sled dogs is much more common in the Upper Yukon than in the delta area and is considered a major factor affecting subsistence use. It is also likely that the sale of subsistence-caught salmon roe (legal from 1974 through 1977) increased subsistence chum salmon catches above normal use levels during that period. Subsistence roe sales were not considered a significant factor affecting harvest levels in the twelve major villages in the Lower Yukon River Area. Additionally, estimates of illegal sales of fall chum and coho salmon and salmon roe in Districts 5 and 6 in 1987 were included with subsistence harvests, because there was no fall commercial fishing season allowed that year.

Alaskan Personal Use Utilization

Due to changes in the state subsistence law in 1986, which limited subsistence hunting and fishing to rural Alaskan residents, the Board of Fisheries created personal use salmon fisheries in the Yukon Area for non-rural state residents. These regulations primarily affected the greater Fairbanks area. Initially, only a fall chum salmon personal use fishery was implemented in 1987. In 1988, personal use fisheries were created for all salmon. Personal use fisheries are regulated much the same as subsistence fisheries except that salmon taken for personal use may be used only for human consumption and bait. In addition, personal use fishermen are required to obtain a fishing permit from ADF&G and to possess a resident sport fishing license.

Typically, personal use catches are included with subsistence harvests in this report. For the most part, personal use fishermen participated as subsistence fishermen prior to establishment of personal use regulations.

Alaskan Commercial Utilization

The relatively recent development and expansion of the commercial salmon fishery has enabled many area residents to obtain a cash income. The cash income in many cases provides a means for the area residents to maintain a subsistence lifestyle. Income earned from commercial fishing is often used to obtain hunting and fishing gear (such as boats, outboards, etc.) utilized for subsistence activities. In recent years (1979-1988), commercial fishermen have received approximately 7.8 million dollars annually (Appendix Table 24). The majority of commercial fishermen are residents of the Yukon River drainage (Table 5).

Most fishermen operate small outboard powered skiffs of 18 to 24 feet in length and do not use gill net rollers or power reels of any type. In recent years, there has been a large increase in the use of larger outboard motors, VHF and CB radios, as well as fish finders, which has increased the efficiency of the fleet.

The majority of the salmon catch is presently processed as a fresh/frozen product in contrast to earlier years when canning and salting were of greater importance (Appendix Table 23). Salmon are processed at shore-based or floating operations with a portion of the catch transported via aircraft outside the area for

processing. In the Upper Yukon Area, production of salmon roe (purchased directly from fishermen) has increased in recent years (Appendix Tables 3 and 4).

Chinook Salmon

During the 1954-1960 period, a 65,000 chinook salmon quota was in effect for the river. Of this total, not more than 50,000 could be taken below the mouth of the Anuk River, 10,000 in the area between the mouths of the Anuk and Anvik Rivers and 5,000 upstream from the Anvik River. During these years, fishing was allowed for five and one-half days a week until specific quotas were obtained. The average chinook salmon catch for this period was 65,092 fish.

Under new regulations established by the Department in 1961, the annual chinook salmon commercial harvest for the entire area averaged 104,280 fish for the period 1961-1970 (Appendix Table 2). This average was a 60% increase over the 1954-1960 period. During the period 1971-1976 catches declined, averaging 88,067 fish annually because of below average runs (except 1971) and regulatory restrictions.

During the late 1970's, chinook salmon commercial catches began increasing. Due to increased efficiency of commercial fishermen and in some years due to above average run strength, chinook salmon commercial catches ranged from 99,970 to 158,018 fish during 1979-1988, averaging 131,348 fish annually (Appendix Table 2).

Summer Chum Salmon

From statehood through 1974, the Yukon River commercial summer chum salmon fishery steadily developed as subsistence harvests declined. Commercial summer chum catches increased rapidly after 1974 as regulations were relaxed and the upriver commercial fishery expanded. Beginning in 1978, in response to unfavorable chum salmon market conditions, the commercial fishery in the Upper Yukon Area became primarily a salmon roe fishery (Appendix Table 3).

Summer chum salmon commercial catches have averaged 734,269 fish and 173,726 pounds of roe annually during the period 1979-1988. The Yukon River summer chum salmon commercial harvest has increased during this time period as a result of regulation changes (e.g. mesh size specifications and earlier openings of the fishing season), increased fishing effort (including expansion of the Upper Yukon Area fishery), greater availability of processing facilities and tendering, higher prices paid to fishermen, the development of Japanese markets, and the occurrence of several very large runs during recent years. The majority of the harvest takes place in Districts 1, 2, (fish in-the-round only), and 4 (primarily roe).

Fall Chum and Coho Salmon

The commercial fishery for fall chum salmon in the Yukon River began in the early 1960's. During the 1961-1968 period, catches averaged only 36,185 fish annually.

Since 1969, (1969-1988) catches have averaged 226,316 fish. Salmon roe sales by commercial fishermen began in the Upper Yukon Area during 1978 and have averaged 4,930 pounds annually (1979-1988) (Appendix Table 4). Fall chum salmon are in great demand and are harvested in all fishing districts because of their good quality (bright, silvery appearance, large size, robust body shape and high oil content), which is related to their destination to spawning areas in the upper portion of the drainage. The largest fall chum catch occurred in 1981 when 466,451 fish and 11,285 pounds roe were taken.

Coho salmon returns to the Yukon River are of lesser magnitude than fall chum salmon and are taken incidental to the commercial fishery for fall chums. Coho salmon catches have averaged 37,356 fish during the period 1979-1988 (Appendix Table 5).

Commercial salmon catches by district and/or statistical area since 1961 are presented in Appendix Tables 2-6, 9, 10, and 16-18.

Alaskan Fishery Development

Lower Yukon Area

Since the onset of the commercial salmon fishery in 1918, the majority of the Yukon River harvest has occurred in the lower river area (primarily Districts 1 and 2) where fishing and processing effort is concentrated and flesh quality is optimal. Historically, the Lower Yukon Area was primarily managed for the harvest of chinook salmon. The lower river fishery during June is now managed for the harvest of both chinook and summer chum salmon. Set and drift gill nets are the legal gear types in the Lower Yukon Area.

Beginning in 1961, when chinook salmon catch quotas were eliminated for Districts 1 and 2, and continuing through 1981, the fishery was regulated by scheduled weekly fishing periods with the season opened by a published regulatory date. Fishing time during the chinook salmon season was allowed for four days a week during 1961-1967, but was reduced to 3-1/2 days a week beginning in 1968, to 3 days a week in 1974 and to 2-1/2 days a week in 1977. Beginning in 1981 a 60,000 to 120,000 chinook salmon guideline harvest range was established for Districts 1 and 2 (Appendix Table 15). Effective for the 1982 season, fishing periods during the chinook salmon season in Districts 1 and 2 were established by emergency order. This was done to provide for adequate chinook salmon escapements in response to increasing fishing efficiency.

Since 1982, the "chinook salmon season" (unrestricted mesh size fishing periods) in these districts usually opens by emergency order between June 5-15 and is closed by emergency order during late June or early July depending on run timing and magnitude. From 1982-1986, fishing periods of 24 hours duration generally occurred twice weekly. During 1987, 12-hour periods were introduced and during 1988 all unrestricted mesh size periods were 12 hours in duration. In 1989, a combination of 12- and 6-hour unrestricted mesh size periods occurred.

Commercial fishing effort increased sharply during 1961-1975, with license registration for set gill nets more than doubling while drift gill net gear

tripled during this period. Set gill nets are commonly used near the river mouth, but drift gill nets are the predominant gear type elsewhere. The best measurement of effort is the number of units of commercial fishing gear operated each year since fishermen have commonly used more than one type of gear during the season (Appendix Tables 7 and 8). With the advent of the Commercial Fisheries Limited Entry (CFEC) program in 1976, fishing effort in terms of the number of participants stabilized, but efficiency has increased. From 1976-1988, an average of 705 CFEC gill net permits have been issued annually (Appendix Table 7).

During 1976-1980, prior to establishment of the 60,000-120,000 guideline harvest range, chinook salmon commercial harvests in Districts 1 and 2 averaged 102,885 fish. For the period 1981-1988, District 1 and 2 chinook salmon harvests averaged 119,823 fish.

In District 3, a 1,800-2,200 chinook salmon guideline harvest range was established in 1979. The commercial salmon fishing season in District 3 opens by emergency order. Fishing is allowed under a schedule similar to Districts 1 and 2. The District 3 catch has averaged 3,133 fish annually (1979-1988).

Sale of other species of salmon captured during the chinook salmon season, excluding the 1920's, has been allowed only since 1967 in the area of the present lower two districts. The incidental catch of summer chum salmon was limited during the chinook salmon season as fishermen could use only gill nets of eight inch minimum stretched mesh. However, beginning in 1970, each fisherman could substitute up to 50 fathoms of gill net of any mesh size in Districts 1 and 2. In 1973 all mesh size restrictions were lifted during the chinook salmon season (from June 1 through early July) in order to allow greater opportunity to use small mesh nets which are selective toward the more abundant summer chum salmon. The majority of fishermen continue to fish the larger mesh chinook salmon nets during periods allowing unrestricted mesh size. Comparative Lower Yukon Area chinook and summer chum salmon catches by mesh size are presented in Appendix Table 11.

The Alaska Board of Fisheries liberalized regulations during the 1970's to provide for harvest of summer chum salmon surplus to subsistence and escapement requirements. A regulation was promulgated in 1973 which specified that gill nets of six inch mesh-size or less could be fished after a specified date in early July in Districts 1 and 2. Use of small mesh gill nets in early July allowed a greater harvest of summer chum salmon and also minimized the chinook salmon catch during the end of the chinook run (Appendix Table 11). Beginning with the 1976 fishing season, a regulation was promulgated which established a flexible range of dates from June 27 to July 5 in Districts 1 and 2, and July 5-15 in District 3, after which only gill nets of six inch maximum mesh size may be used. Effective for the 1985 fishing season, a regulation was promulgated which eliminated specific dates and implemented emergency order authority in establishing restricted mesh size periods (six inch maximum mesh size) in Districts 1, 2, and 3. Additionally, the Board of Fisheries issued a directive to the Department to provide for summer chum salmon directed fishing periods (6 inch maximum mesh size) prior to the end of the chinook salmon season if the summer chum salmon run was average or better in strength.

In recent years (1979-1988) the Lower Yukon Area commercial summer chum salmon catch has averaged approximately 651,750 fish annually (Appendix Table 3).

Since 1961, with the exception of the 1987 season, the commercial fishing season in the lower Yukon districts has been reopened following the closure of the chinook salmon season to allow harvest of fall chum and coho salmon.

Prior to 1973, the closure between the chinook (summer) and the fall chum salmon (fall) seasons (often during late June and most of July) was primarily for the purpose of insuring an adequate supply of summer chum salmon for upriver subsistence fishermen. This closure also provided protection for the late stages of the chinook salmon run.

A 200,000 fall chum salmon quota (after mid-July) was implemented for the combined lower three districts in 1974. Also, fishing time was reduced from four to three days a week in Districts 1 and 2. These actions were necessary to stabilize the catch in view of increased fishing effort and improved efficiency, and to provide for a harvest in the newly established Upper Yukon Area fishery. In 1979, fishing time was reduced further to two days a week and the 200,000 quota was replaced by a flexible guideline harvest range of 120,000-220,000 fall chum salmon.

Effective beginning in 1983, fishing time has been regulated by emergency order in Districts 1, 2, and 3. From 1983 through 1985, two twelve hour fishing periods per week were established by emergency order in Districts 1 and 2, except that fishing time remained at two days a week for set net fishermen in the coastal Set Net Only Area of District 1 (Figure 15). Fishing time in District 3 was reduced from 3 to 2 days a week. Also, a 7-10 day season closure in Districts 1, 2, and 3 during late July was established.

Fishing time was further restricted in 1986 through implementation of the Yukon River Fall Chum Salmon Management Plan in anticipation of poor returns of fall chum salmon during 1986-1988. A season closure of July 15 was established to protect the early portion of the fall chum salmon run and to provide the Department an opportunity to evaluate run strength. Additionally, the guideline harvest range was reduced to 0-110,000 fall chum salmon for Districts 1, 2, and 3. The commercial fishing season was opened by emergency order authority. Under this management plan there was a possibility of no commercial fall chum fishery as occurred during 1987. During 1986 and 1988, based on the assessment of in-season run strength, fishing period duration was restricted from that of previous years. Lower Yukon Area fall chum salmon catches since 1970 range from 131,313 to 341,760 fish, with the exception of 1986 through 1988 seasons when the harvest ranged from 0 to 113,400 fish (Appendix Table 4).

The harvest of coho salmon in the Lower Yukon Area is incidental to the harvest of fall chum salmon, with the commercial season closing after an appropriate harvest of fall chum salmon occurs. The coho salmon run peaks during middle to late August in the lower river. Lower Yukon coho salmon catches averaged 34,026 fish annually from 1979-1988 (Appendix Table 5).

Nearly all of the lower Yukon River salmon catch is destined for markets as a fresh-frozen product. Freezer ships and barges are located in the vicinity of

Emmonak. Fresh salmon is transported by aircraft from St. Marys and Marshall annually, and from Russian Mission and the Paimuit-Holy Cross area during some seasons for further processing. Beginning in 1988, with the opening of a new, longer runway in Emmonak, fresh salmon have been flown out from this village also. A hard salting operation is located at Black River.

Upper Yukon Area

Prior to 1974, the Upper Yukon Area (above the confluence of the Koyukuk River) was designated as a single district (District 4). By regulation, commercial fishing was allowed 7 days per week until the quotas of 2,000 chinook salmon and 2,000 chum and coho salmon (combined) were taken. These quotas were established for the purpose of allowing a very limited commercial utilization which had occurred for many years. Fish wheels and set gill nets are the legal gear types for commercial fishing in the Upper Yukon Area.

In recent years, however, the upriver commercial fishery has expanded. Fishing effort nearly doubled from 1972 to 1973, and processors developed outside markets, due in part to the steadily increasing price of salmon the market was experiencing. In recognition of the developing upriver commercial fishery and the desire of fishermen in the upper portion of the drainage to achieve increased participation, the Alaska Board of Fish and Game adopted several major regulation changes prior to the 1974 fishing season. These regulations provided for substantial increases in the upriver catches, reduced gear conflicts, and made provisions for allowing escapement needs to be met. These regulations included:

1. District 4 was reduced in size and redefined as that portion of the Yukon River drainage from the mouth of the Bonasila River to the mouth of Illinois Creek at Kallands.
2. Two new districts, 5 and 6, were added.
3. Salmon catch quotas were established for the Upper Yukon Area as follows:
 - a. District 4: 1,000 chinook salmon and after August 15, 10,000 chum and coho salmon combined for the area.
 - b. District 5: 3,000 chinook salmon and after August 15, 25,000 chum and coho salmon combined for the area.
 - c. District 6: 1,000 chinook salmon and after August 15, 15,000 chum and coho salmon combined for the area.
4. In Districts 4, 5, and 6 the weekly commercial fishing period was reduced from 7 to 5 days per week.

Since that time, the Alaska Board of Fisheries has enacted a number of major regulation changes in the Upper Yukon Area:

1. Weekly fishing periods were reduced in all districts (except the upper portion of District 5) from 5 to 4 days per week, and split-period (two 48

hour periods) fishing schedules were established in 1980. In District 4, the commercial fishing season opened by emergency order between June 10 and June 25.

2. Chinook salmon and fall chum and coho salmon quotas were replaced by flexible guideline harvest ranges beginning in 1979. The current chinook salmon guideline harvest ranges of 2,250-2,850 fish for District 4, 2,700-3,300 fish for District 5, and 600-800 fish for District 6 were established in 1981. The current combined fall chum and coho salmon guideline harvest ranges were established in 1986: District 4: 0-20,000 fall chum and coho salmon combined; District 5: 0-20,000 fall chum and coho salmon combined; and District 6: 0-10,250 fall chum and coho salmon, combined.
3. District 4 boundaries were redefined and new subdistricts created to allow for stock-specific management of fall chum and coho salmon in 1979.
4. New subdistricts within District 5 were created in 1981 to achieve more balanced harvests and escapements.

In the spring of 1988, the Alaska Board of Fisheries met in special session to take public and staff testimony on proposed salmon management practices on the Tanana River. During this special session, the Board adopted regulations which:

1. Reduced allowable commercial and subsistence fishing time from two 48 hour periods per week to two 42-hour periods per week.
2. Specified that there be no more than one 42-hour commercial fishing period per week during the fall season.
3. Minimized abuse in the subsistence fishery by requiring subsistence fishing permits, catch limits, and in-season reporting requirements.
4. Expanded rights of inspection of processing plants by enforcement personnel.

The Board further instructed the staff to manage the fishery on the basis of existing guideline harvest ranges, indicating that these guidelines are to be exceeded only if it can be determined that doing so would not jeopardize meeting subsistence and spawning escapement requirements.

The major difference between the Lower and Upper Yukon Area fisheries is their relative size, both in numbers of fishermen and catch. Overall, there is a lower abundance of fish available for harvest the further upriver a fisherman is located from the mouth because of the migration of fish into tributary streams and harvests downriver. The Upper Yukon Area commercial salmon harvest has averaged approximately 12% of the total area harvest of fish sold in the round and 100% of the roe sales (1982-1988). During the same time period, the Upper Yukon districts have had an average of 149 participating fishermen or approximately 18% of the Yukon Area total (Appendix Table 7).

For reasons of relative abundance, flesh quality, and the existing regulation structure, the chinook and fall chum salmon runs are the target species of the commercial fishery in Districts 5 and 6. The summer chum salmon run is of paramount importance in District 4 and comprises the majority of the total upriver commercial harvest (78% of fish sold in the round, 98% of roe sales). Relatively few summer chum salmon are taken commercially in Districts 5 and 6. In the Upper Yukon Area, summer chum salmon flesh is difficult to market because of the relative high cost of transporting fish to market, and their advanced state of sexual maturity and consequent poor quality; however, roe quality of summer chums is judged by the industry to be excellent.

The Upper Yukon Area commercial fishery developed at a time (mid to late 1970's) when salmon runs on the west coast were generally depressed. For this reason, processors were able to overcome quality problems and transportation costs and find ready markets for their product. In recent years, however, salmon runs throughout Alaska have rebounded, and processors must compete with higher quality sockeye and chum salmon. Prices paid for upriver chum salmon (primarily summer chum salmon) have not kept pace with inflation. This has resulted in the development of salmon roe sales beginning in 1978.

To varying degrees between years and districts, markets for chum salmon in-the-round remain available for higher quality male summer chum salmon and fall chum salmon (Appendix Tables 3 and 4). Carcasses resulting from roe extraction appear to be fully utilized for subsistence purposes except for District 4 summer chum harvests since 1980. Total utilization of District 4 summer chum salmon harvests have been estimated since 1980 based on fish ticket sales (either in the round or as roe), estimated sex ratio as documented by the Department operated fish wheel located near Kaltag from 1981 to 1985, subsistence survey results, and estimates of average roe weight per female chum salmon. During the period of 1984-1988, approximately 374,192 summer chum salmon have been harvested annually in association with the District 4 commercial fishery (Appendix Table 6). A portion of the carcasses resulting from this catch is utilized for subsistence purposes (primarily for dog food), however, significant wastage is suggested by the large difference between the estimated commercial harvest and the reported subsistence harvest.

In 1989, a comprehensive study was conducted in District 4 to collect more accurate average roe weight per female and sex ratio data to estimate the total commercial related summer chum harvest (Attachment 3, special study). The average roe weight per female for the 1989 season was calculated to be 0.9 pounds. A similar average roe weight per female was estimated in samples collected in 1988. Prior to 1988, an average roe weight of 1.0 pounds per female was estimated based on the subjective judgement of processors and fishermen. Sampling of catches from various fish wheels and gill nets resulted in an estimated mean proportion of 0.62 females for the 1989 season. The mean proportion of females in the commercial harvest estimated by this study was larger than the mean proportion of females captured at the Stink Creek test fish wheel which ranged from 0.566 to 0.600 (1981-1985).

Fish wheels are the primary type of gear for harvesting summer chum salmon because of local fishing conditions, efficiency, and relative ease of operation.

Fish wheels account for roughly 95% of the commercial harvest of this species in the Upper Yukon Area.

Chinook salmon are of lesser importance to the commercial fisheries in the three upper districts; the total harvest guideline range allocated by the Alaska Board of Fisheries is 5,550 to 6,950 chinook salmon (Appendix Table 15). The guideline harvest range is not met in District 4 during most years, as most fishermen choose to retain chinook salmon for subsistence use. In the Tanana River (District 6), the upper end of the chinook salmon guideline harvest range is normally taken by late July, and in most years the season remains closed until early to mid-September. A relatively intense fishery for chinook salmon has developed in the lower portion of District 5, and considerable (gill net) effort occurs during July.

The majority of commercially caught chinook salmon are transported to Fairbanks and other population centers for primary processing and sold to wholesalers outside the state as a fresh/frozen product. The balance of the chinook salmon catch is sold to local supermarkets and restaurants. Most fall chum salmon harvested in these districts are tendered by boat or single-engine aircraft from collection points along the river and are subsequently trucked or flown to processing plants in Manley, Galena, or Nenana for processing. A portion of the fall chum harvest is marketed as a fresh/frozen product, and small quantities of chinook and fall chum salmon are smoke-cured and sold as "strips", a local specialty product. In addition, undocumented quantities of chum and coho salmon taken commercially are dried and sold as dog food.

Canadian and Marine Harvests of Yukon River Origin Salmon

Canadian

Records of Canadian commercial utilization of Yukon River origin salmon indicate a fishery occurred sporadically from 1903 to 1917 and continuously from 1918 to 1947. No harvest records are available from 1948 to 1957 (Appendix Table 1). Since 1958 harvest records document the annual catch by species, and since 1961, by user group. The average Canadian chinook and fall chum salmon harvests during the most recent five years (1984-1988) were greater than the previous five-year average (1979-1983) by 25% and 100%, respectively. During recent years, while U.S. commercial fall chum harvests were restricted in order to provide for conservation of depressed spawning stocks, Canadian commercial fishermen were taking record and near record catches.

U.S./Canada - Treaty Negotiations

In the spring of 1985, the governments of the United States and Canada ratified the Pacific Salmon Treaty; although Yukon River fishery issues were not specifically addressed in this document, one provision of the treaty required the two countries to begin negotiations regarding Yukon River salmon stocks which originate in Canada.

Since that time, U.S. and Canadian delegations have met in briefing sessions and in six formal negotiation sessions. The U.S. delegation is composed of a Department of State attorney acting as Chief Negotiator or his alternate, representatives of the Department of Fish and Game, United States Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS), and 14 members of the public who represent subsistence and commercial fishing interests along the Yukon River.

Little progress has been made in these negotiations, particularly concerning salmon allocation between the two countries. However, fishermen from both countries have gained an understanding about their respective fisheries and the need for protecting spawning stocks.

One benefit of these negotiations is the formation of a Joint Technical Committee composed of fishery scientists from both nations. The work of this committee is resulting in the development and exchange of important fishery data and a better understanding of salmon conservation requirements.

High Seas Salmon Gill Net Fisheries

Chinook salmon of western Alaska origin have been intercepted yearly by the Japanese mothership and landbased gill net fisheries (Appendix Table 40). Revised estimates indicate an average of 141,000 chinook salmon were taken during 1975-1983. Yukon River chinook salmon comprised the majority of western Alaska stocks taken in the Bering Sea mothership catches. In 1980 a total of 438,000 western Alaska chinook salmon was estimated to have been taken in these fisheries which exceeded the domestic commercial catch in western Alaska for that year.

Although reported foreign catches have decreased in recent years, it is believed that high seas fishing mortality including gill net dropouts (estimated to be 30% of the reported catch in one study) and possible under-reporting of catches result in continued losses of western Alaska fish.

The 1988 catch of chinook salmon by the Japanese mothership and land based gill net fisheries was 16,000 fish and 51,000 fish, respectively. Estimates of the numbers of western Alaska chinook salmon in these harvests are not available.

Foreign, Joint Venture, and U.S. Domestic Groundfish Fisheries

Information on incidental salmon catches in offshore fisheries is not complete for recent years (Appendix Table 40). In 1989, joint venture groundfish fisheries captured 14,538 salmon (all species) in the Bering Sea and Aleutian Islands area. There was no joint venture fishery in the Gulf of Alaska during 1989.

Continued concern exists over large foreign trawl fisheries operating in international waters ("doughnut" area) of the Central Bering Sea. It is speculated that the total groundfish catch of all nations in this area may exceed 1,000,000 m.t. Since there are no international agreements that require observer

coverage on this fleet, the incidental catch of chinook salmon, which are known to be in this area, is unknown.

Due to the lack of an observer program, the numbers of salmon taken by the U.S./domestic groundfish fleet is also not known. This is of concern since the U.S. groundfish fishery is rapidly expanding with 400,388 m.t. taken in 1987. This catch represented 22% of the total groundfish catch of all nations in the Gulf of Alaska and Bering Sea-Aleutian areas in 1987. The National Marine Fisheries Service is planning on initiating an observer program beginning in 1990.

Alaska Peninsula

The majority of salmon captured during June in the Unimak and Shumagin Islands area, located on the south side of the Alaska Peninsula, are bound for terminal fisheries in the northern gulf of Alaska and the Bering Sea, including the Yukon River. The stocks contributing to this fishery have been described by several tagging studies, including a tagging study in 1987 and a 1983 scale pattern analysis study. Sockeye salmon is the target species in the June fishery, but relatively large incidental catches of chum salmon are made. The sockeye salmon harvest is regulated by a quota that is annually adjusted according to the Bristol Bay sockeye salmon forecast. A 400,000 chum salmon quota was also in effect during 1986, but was not extended by the Alaska Board of Fisheries to the 1987 fishery. However, the Board adopted a 500,000 chum salmon quota for the 1988 and 1989 fisheries. A total of 1,745,000 sockeye and 456,000 chum salmon was taken in the June 1989 fishery. The previous 5 and 10 year average chum salmon harvests by this fishery are 427,000 and 522,000 fish, respectively.

Norton Sound

A commercial harvest of 5,707 chinook salmon was taken in coastal Norton Sound waters in 1989. Some Yukon River chinook salmon are known to be intercepted by this fishery. The previous 5 year average harvest was 10,226 fish.

Escapement Enumeration

An essential requirement in management of the Yukon River salmon fisheries is the evaluation of annual salmon spawning escapements. Knowledge of escapements is necessary for several reasons directly applicable to fisheries management:

1. Provides information for determining optimum escapement levels or goals for selected spawning areas or management units.
2. Provides annual escapement trends for evaluation of the effectiveness of the management program and, in turn, the basis for proposing regulatory changes and management strategies.
3. Provides information for use in projecting returns.

The Yukon River drainage is too extensive for comprehensive escapement evaluation of each spawning area. Therefore, the department has employed a system of escapement evaluation which utilizes information from a variety of sources.

Near Pilot Station, a sonar project has been conducted in the mainstem Yukon River annually since 1986 which counts fish on a statistically designed sample plan as fish pass the sonar site (river mile 123). A test net program is conducted in conjunction with sonar enumeration to apportion the counts of fish by species. The sonar estimates of fish passage beyond the sonar site are compared between years as an index of abundance. This information is used on a daily basis for lower river fisheries management. Enumeration of chinook salmon stocks has not been successful to date.

For selected spawning streams (Anvik, Chandalar, Chena, Salcha, Delta, Fishing Branch and Whitehorse fishway), comprehensive enumeration studies are conducted by ground surveys, counting towers, weirs, mark and recovery programs, and hydroacoustic sonar projects. These projects are limited in number, considering the total number of spawning areas, due to the cost of equipping, manning, and operating more sophisticated enumeration projects.

Consequently, low-level aerial surveys from single-engine, fixed-wing aircraft are a primary method used to obtain escapement information. The advantage of aerial surveys is the cost-effectiveness of obtaining escapement information throughout an extremely vast area, most of which is remote. Among the disadvantages are that results may be highly variable if non-standardized procedures are used.

Variability in aerial survey accuracy is dependent upon a number of factors such as weather and water conditions (turbidity), timing of surveys with respect to peak spawning, type of aircraft, survey altitude, experience of both pilot and observer, and species of salmon being enumerated. It is generally recognized that aerial estimates are lower than actual stream abundance due to these factors. Further, peak spawning abundance measured by aerial survey methods is significantly lower than total season abundance due to the die-off of early spawners and arrival of late fish. Also, aerial estimates in a given stream may demonstrate a wide range in the proportion of fish being enumerated from year to year. Peak aerial counts, however, can serve either as indices of relative abundance for examination of annual trends in escapement or estimation of total escapement from base year data or established expansion factors, or they may be used to apportion tributary spawning distribution to a mainstem total escapement estimate obtained from sonar or tower counts.

Due to the huge size of the Yukon River drainage, representative selected spawning streams have been designated as "index areas" and receive highest aerial survey priority. Index areas have been designated due to their importance as spawning areas and for being representative of other unsurveyed streams in the general area. Escapement estimates of index streams not only provide yearly escapement trends but also allow for post-season evaluation of management strategies. Preliminary escapement objectives have been established for some tributary systems based on historic escapement levels. The escapement objectives are considered the minimum number of spawners necessary to maintain the reproductive potential of each stock (Table 18).

In order to gain greater understanding of escapement requirements and fluctuations in run size by spawning stocks, several specific projects are underway. Stock composition modeling is being utilized for chinook salmon based on scale pattern analysis. In addition, electrophoretic techniques are being used by USFWS in an effort to identify discrete stocks of chinook and chum salmon.

Management

The overall goal of the Yukon Area research and management programs is to manage the various salmon runs and the herring return on an optimum sustained yield basis. Subsistence fishing has been designated by the Alaska State Legislature and the Alaska Board of Fisheries as the highest priority use. The management of the Yukon River salmon fisheries must take a conservative approach to maintain the subsistence priority, and to provide for spawning area escapements to sustain production of the resource.

There is a lack of adequate comparative catch and return data on which to evaluate the long term effects of increased commercial harvests since most of the fisheries have only developed or expanded in recent years. Effective management of the fisheries is difficult due to the variety of user groups, the complexity of multi-stock, multi-species salmon runs and the immense size of the Yukon River drainage. Fisheries distributed over 1,400 river miles harvest stocks of fish that are up to several weeks and hundreds of miles from their spawning grounds. The Yukon River commercial fishery is a mixed stock fishery and as a result some tributary populations may be under or over harvested in relation to their actual abundance. It is impossible to manage stocks separately, based on current knowledge, and there is concern that small spawning populations may be reduced to very low levels.

Accurate in-season assessments of escapements immediately past the intensive downriver fishery are very difficult with the present available technology and funding. Although the sonar project at Pilot Station can provide estimates of fish passage, stock-specific composition is unknown.

The two basic regulations used to manage the commercial salmon harvest are emergency order authority, which is used to implement fishing season openings and closures, fishing periods, and mesh size restrictions; and guideline harvest ranges. Commercial fishing is normally allowed for a total of from one to four days per week depending on the district and species involved. In recent years fishing time in the Lower Yukon Area has been significantly reduced. Guideline harvest ranges have been established for chinook and fall chum salmon fisheries throughout the drainage.

During the fishing season the salmon return is monitored on a daily basis through management and research programs. In-season data is compared to data from other seasons in relationship to escapements and total harvests during those years. If it becomes apparent that the run is substantially smaller or larger than needed for escapement and subsistence requirements, then the commercial harvest rates can be adjusted through the use of emergency orders. A list of emergency orders dealing with changes in fishing time and other regulations issued for the

harvests taken through the use of permits in 1989 are summarized in Table 15 and historical permit catches in Appendix Table 32.

Lower Yukon Area

During 1989, an estimated 16,781 chinook, 96,960 summer chum; 15,968 fall chum and 10,720 coho salmon were harvested by fishermen representing 642 households for subsistence and personal use purposes in the Lower Yukon Area (Table 14). The catch of chinook was 10% above the recent 5-year average. Summer chum salmon subsistence use was 48% above the recent 5-year average. Catches of fall chum salmon were 36% below the recent 5-year average, while coho catches were 14% above the recent 5-year average (Appendix Tables 28-31).

It is likely that the summer chum subsistence harvest was much larger than recent years because of a very large return. In some instances, fishermen could not sell their entire chum catch during a commercial period, and large catches were obtained with very little effort. Fall chum salmon subsistence catches were probably lower than average due to the large summer chum harvest.

Upper Yukon Area

The 1989 Upper Yukon Area (excluding Canada) combined subsistence and personal use salmon catch was estimated to be 34,499 chinook, 72,262 summer chum, 200,725 fall chum, and 30,790 coho salmon. The catch of chinook was 14% above the recent 5-year average. The catch of fall chum salmon was 30% above the recent 5-year average (excluding the 1987 harvest). Summer chum (including 80,360 fish reportedly used from commercial catches) and coho salmon catches were 27% and 25% below the recent 5-year average, respectively. The personal use portion of this harvest was 2,330 chinook, 1,510 summer chum, 5,064 fall chum and 813 coho salmon and was taken by approximately 153 permit holders.

In District 4 it is difficult to differentiate between subsistence and commercial catches due to the nature of the commercial roe fishery. Within District 4, an estimated 72,262 summer chum salmon were taken for subsistence use which were unrelated to commercial fishing activities during 1989. In addition, a total of 510,244 summer chum salmon were estimated to have been taken during commercial fishing activities. Only 18,554 of these fish were sold in the round. The utilization of 80,360 summer chum salmon from the commercial fishing harvest for dog food was reported during subsistence surveys. There is still a large number of summer chum unaccounted for. It is very difficult to separate commercial from subsistence use in this district, and to ensure all fish harvested are accounted for and that no fish are double counted.

Subsistence fishing permits are required in three areas within the upper Yukon drainage: (1) the Tanana River drainage; (2) the Yukon River between Hess Creek and Dall River; and (3) the Yukon River between the upstream mouth of Twenty-two Mile Slough and the U.S./Canada border (Table 14 and 15; Appendix Table 32).

Commercial Fishery 1989

In 1989, a total of 1,415,399 salmon were commercially harvested in the Alaskan portion of the Yukon River (Table 4). The catch was composed of 101,840 chinook, 959,994 summer chum, 270,195 fall chum, 83,353 coho, and 17 pink salmon (Table 4). In addition, 288,549 pounds of summer chum roe and 14,749 pounds of fall chum salmon roe were sold by commercial fishermen. A total of 440 chinook, 6,267 summer chum, 16,984 fall chum and 2,140 coho salmon were sold by contracted fish wheel operators as part of a Department test fish project in District 6.

The commercial harvest in Alaska for all species was 40% above the 1984-1988 average of 1,009,331 fish; roe production was 41% above the 1984-1988 average. The chinook salmon catch was 15% below the recent 5-year average (1984-1988). The summer chum salmon catch and roe harvests were 1.4 and 1.3 times, respectively, greater than the recent 5-year average. The fall chum salmon harvest in Alaska was 61% above the 1984-1988 average. The coho harvest was second highest on record and was 52% greater than the recent 5-year average. In the Canadian portion of the drainage, a commercial harvest of 9,789 chinook salmon occurred, which was 15% below the recent 5-year average. There was an additional commercial harvest of 17,549 fall chum salmon in Canada, 38% less than the recent 5-year average.

Yukon River fishermen in Alaska received an estimated \$10,180,100 for their catch, approximately 29% above the recent 5-year average value. The first wholesale value of the 1989 pack was estimated at \$25,450,150 (Appendix Table 24). Buyers and processors operating in the Yukon Area during 1989 are listed in Table 3. The majority of the salmon catch was processed primarily as a fresh/frozen product. Commercial salmon and salmon roe production data is presented in Appendix Table 23. Average prices paid to fishermen, and average salmon weights are presented in Appendix Tables 25 and 26, respectively.

In 1989, a total of 791 Commercial Fisheries Entry Commission (CFEC) gill net permits and 160 fish wheel permits (not including transfers) were issued (Appendix Table 7). Table 5 shows the residency of those issued CFEC permits for 1989. The actual number of commercial fishing permits (fishermen) that made at least one salmon delivery by district during the season are shown in Appendix Table 8.

Chinook salmon harvest age composition data indicated a fairly normal proportion of 6-year old fish (52%) in the commercial and subsistence harvests (Appendix Table 38). However, 5-year old fish comprised 32% of the catch, which was the highest proportion of age 5 fish for the years 1982-1989. As in 1988, higher overall proportions of younger age chinook in the harvest may be the result of increased fishing time with restricted mesh size gill nets in the Lower Yukon Area.

Samples collected from summer chum harvests resulted in an age composition of 41% 4-year-olds and 58% 5-year-olds. The results show a slightly higher proportion of 5-year-olds compared to most other years (1982-1988). Fall chum salmon samples indicated that age 3, age 4, age 5 and age 6 fish comprised 1%, 86%, 13% and <1% in the harvest respectively. Age 4 coho salmon dominated samples taken from Yukon River fisheries as observed in all other years (Appendix Table 38).

Lower Yukon Area

The 1989 Lower Yukon Area (Districts 1, 2 and 3) commercial salmon catch totaled 1,251,490 fish which was comprised of 94,023 chinook, 899,171 summer chum, 191,114 fall chum, and 67,182 coho salmon (Appendix Tables 2-5).

Fishing effort, in terms of the actual number of participating fishermen (permit holders), is presented in Appendix Table 8. In 1989 a total of 716 CFEC gill net permits were issued for the Lower Yukon Area (Appendix Table 7). A total of 687 permit holders fished at least once during 1989. Lower Yukon fishermen were paid an average (per pound) of \$2.77 for chinook, \$0.34 for summer chum, \$0.50 for fall chum and \$0.66 for coho salmon. The approximate (ex-vessel) value of the harvest was \$8,436,100. The average earnings per fisherman was approximately \$12,280.

A total of 9 processors operated in the Lower Yukon Area in 1989. Nearly all of the commercial salmon catch was shipped to fresh or fresh/frozen markets. One processor in District 1 hard-salted a total of 32 half tierces of chinook and chum salmon. Canning of salmon in the Yukon Area has not occurred since 1984.

Chinook Salmon

The mean April air temperature in Nome was 25 degrees fahrenheit which typically is indicative of early run timing (Appendix Table 39), however, chinook salmon migratory timing into the lower river appeared to be about average. The Lower Yukon Area was generally free of ice by May 31, which was later than anticipated. The first chinook salmon was reported to have been captured June 1 in St. Marys by a subsistence fisherman. The first chinook and summer chum salmon were caught in Department test fishing nets on June 5 and June 6, respectively. The chinook salmon return was primarily through north and middle mouths, whereas summer chum salmon were abundant in all major passes based on commercial and test net catches. Department test net catches of summer chum salmon increased rapidly, while chinook catches increased less dramatically. The relative increase of chinook and summer chum salmon was further documented by subsistence catch reports.

In response to an early abundance of summer chum salmon, restricted mesh size fishing periods were implemented prior to the first unrestricted mesh size fishing periods in Districts 1 and 2 (Tables 6 and 7). This allowed for an earlier initiation of the commercial fishing season and an increased harvest of summer chum salmon than would have resulted if the fishery had been delayed until sufficient chinook were present to support an unrestricted mesh size fishery.

The directed fishery for chinook salmon was opened by emergency order after approximately seven to ten days of increasing subsistence and test net catches in the lower Yukon River. The fishery was opened on a staggered basis: June 15 in District 1, June 18 in District 2, and June 21 in District 3. A fishing schedule of two 12-hour periods per week was established.

The unrestricted mesh size fishing season in Districts 1 and 2 consisted of two 12-hour fishing periods and one 6-hour fishing period in each district. This was

the least amount of fishing time directed for chinook salmon in the history of the fishery. The cumulative chinook salmon harvest for Districts 1 and 2 following the second District 2 unrestricted mesh size period was 57,600 fish. This harvest included 9,345 chinook salmon taken during chum salmon directed fishing periods prior to the opening of the unrestricted mesh size fishing season. In addition to the catch being near 60,000 fish, analysis of comparative test fishing and sonar enumeration data indicated that the chinook salmon return was apparently a little below average in magnitude at this stage of the run. Therefore, fishing time was reduced to 6 hours during the last unrestricted mesh size fishing period in Districts 1 and 2. A total of 29,203 chinook salmon were harvested during the restricted mesh size fishing periods following the chinook salmon directed fishery.

The total District 1 and 2 chinook salmon harvest was 92,378 fish, 3% above the mid-point of the guideline harvest range and 18% below the 1984-1988 average harvest.

In District 3, three 12-hour unrestricted and three 12-hour restricted mesh size fishing periods were allowed from June 21 through July 10 (Table 8). Fishing periods were established to occur simultaneously with District 2 commercial fishing periods to provide fishermen in the lower end of District 3 the convenience of selling fish to District 2 buyers. The initial delay in opening District 3 allowed the first segment of the chinook salmon return to pass through the district prior to the commercial fishery. In response to subsistence fishermen requests, the upper end of District 3 was closed June 30 to commercial fishing to allow increased subsistence fishing opportunities. A total of 1,645 chinook salmon were harvested in District 3, which was 18% below the mid-point of the guideline harvest range, and 20% below the recent five year average.

Summer Chum Salmon

In Districts 1 and 2, fishing periods directed toward summer chum salmon with gill nets restricted to six-inch maximum mesh size were implemented prior to the first chinook salmon directed fishing periods. These fishing periods of 12 hours duration were implemented in response to indications of an abundance of summer chum salmon while the chinook salmon return was in an early stage of development. A total of 143,978 summer chum salmon were captured in Districts 1 and 2 during these restricted mesh size fishing periods. During unrestricted mesh size fishing periods from June 15 until June 25 in Districts 1 and 2, 126,360 summer chum salmon were harvested.

After the unrestricted mesh size fishing season ended, test fishing data indicated a large abundance of summer chum salmon entering the river, therefore, additional fishing periods with gill nets restricted to six-inch maximum mesh size were allowed on June 24-25 in District 1 and June 27 in District 2.

Approximately 290,000 chums were harvested during a four day time span from June 24 through June 27. The next regularly scheduled period in District 2 was not allowed in order to reassess run strength. The sonar project at Pilot Station indicated increased fish passage rates on June 28, and a six-hour period was

implemented on June 29 in District 2. After this period, the regular fishing schedule was maintained throughout the remainder of the season.

Commercial chum salmon harvests in 1988 and early in the 1989 season indicated that 12-hour fishing periods provided ample opportunity for fishermen to harvest chums and to allow buyers to handle the volume of fish during a large return. Therefore, when the twice weekly restricted mesh size fishing schedule was initiated, fishing periods were maintained at 12 hours duration. This was a 12-hour reduction in fishing time per period from prior years during this portion of the run. During these periods, an additional 612,255 summer chum salmon were harvested. The total District 1 and 2 summer chum salmon commercial harvest was 891,593 fish, 43% above the recent 5-year average. The commercial fishing season closed July 15 by regulation.

The District 3 commercial fishery allowed for three 12-hour restricted mesh size periods following three 12-hour unrestricted mesh size fishing periods. The commercial season closed July 10 as the chinook salmon harvest approached the lower end of the guideline harvest range, and summer chum salmon flesh quality deteriorated. The closure additionally provided subsistence fishermen an increased opportunity to harvest salmon. The District 3 summer chum salmon harvest was 7,578 fish, approximately double the recent 5-year average (1984-1988).

Fall Chum and Coho Salmon

An average return of fall chum salmon was expected in 1989 based on evaluation of brood year escapements and assuming average survival. The primary contributor to the 1989 return was expected to be 4-year old fish produced by the 1985 parent year. A projection of the fall chum salmon return based on an estimate of total parent year escapements, the average maturity schedule, and expected returns per spawner indicated the Lower Yukon Area commercial catch would be near the mid-point of the pre-1986 guideline harvest range (170,000 fish).

Initially, fall chum salmon migratory timing into the lower river appeared to be early. However, by late August, it was apparent that run timing was average and of longer duration than other comparable years. Commercial catch sampling during the last period of the summer season in District 1 on July 13 and 14 indicated a large proportion of the catch was composed of fall chum salmon. Subsistence and test net catches documented a fairly sustained entry of fall chum salmon from July 16 through July 27. After July 27, three pulses of fall chum entered the river during August 3-6, August 13-14, and August 17-18. Coho salmon migratory timing into the lower river was about average. Consistent daily test net catches of coho salmon did not begin until August 3, with no significant entry occurring until August 8.

The fall season commercial salmon fishery was opened by emergency order on July 28 in District 1 and July 30 in Districts 2 and 3. A fishing schedule of 12 hours duration in the coastal "Set Net Only Area" where tides affect actual fishing time, and six hours duration in the remainder of District 1, and in Districts 2 and 3, was established. Fishing time was more conservative than anticipated in the management plan due to the efficiency of the fleet and the

vulnerability of fall chum salmon because of their pulse type of entry pattern. Typically, fall chum salmon enter the river in relatively short pulses during windy weather. Fishing time was increased by four hours in the "Set Net Only Area" and three hours in the remainder of the Lower Yukon Area approximately half-way through the commercial fishing season (Tables 6 and 7).

A total harvest of 143,000 fall chums had been taken as of 16 August. Historical test fishing and sonar data indicated that usually by August 17, over 80% of the run had passed. The District 1 period scheduled for August 17-18 was canceled to assure that a large enough portion of the fall chum salmon run would pass through the Lower Yukon Area to adequately contribute to: 1) escapement requirements; 2) subsistence harvest requirements; and 3) provide for commercial harvests in Upper Yukon districts. This delay additionally allowed the Department to further evaluate run strength and for the ratio of coho salmon to fall chum salmon within the districts to increase.

After this action was taken, test fish catches of fall chum salmon increased; therefore, further commercial fishing was allowed. Eliminating a single period did result in an atypical distribution of catches between Districts 1 and 2. This was the first year in which District 2 had a larger fall chum salmon catch than District 1, although the harvest has been nearly equal in some years. A total catch of 77,876, 97,906, and 15,332 fall chum salmon occurred in Districts 1, 2, and 3, respectively.

The commercial fishing season closed by emergency order on August 25 in District 1 and on August 27 in Districts 2 and 3. The Lower Yukon Area coho salmon catch was 24,670 in District 1, 38,517 in District 2, and 3,988 in District 3. Sonar data indicated that coho salmon passage rates were lower than all previous years (1986-1988).

Upper Yukon Area

The Upper Yukon Area commercial salmon harvest totaled 7,817 chinook, 60,823 summer chum, 79,081 fall chum and 16,171 coho salmon in 1989. In addition, 303,298 pounds of fall chum roe were sold (Table 4). Salmon production data is expressed as number of fish sold in the round, and pounds of unprocessed roe which were sold. Table 13 and Appendix Table 6 present total estimated commercial related chum salmon catch by district during 1989. These catch figures reflect the estimated incidental catch of male summer chum salmon which were not sold and the estimated number of female chums harvested during the roe fishery in the Upper Yukon Area. Table 12 presents commercial salmon catch by gear type (set gill net and fish wheel).

A total of 14 buyer/processors and 11 catcher-sellers operated during 1989. Upper Yukon commercial fishermen received an estimated average (per pound, round weight) of \$0.84 for chinook, \$0.24 for summer chum, \$0.28 for fall chum, \$0.35 for coho salmon, and \$4.41 for salmon roe (Appendix Table 25). The approximate (ex-vessel) value of the 1989 harvest was \$1,744,000 which includes an estimated 1.3 million (77%) paid to fishermen for salmon roe sales. During the 1989 season, 169 upper Yukon fishermen participated in the commercial fishery. The average earnings per fisherman was approximately \$10,320.

Chinook Salmon

District 4 opened to commercial fishing by emergency order on June 21 on a twice weekly 48-hour fishing schedule. A total of 12 fishing periods occurred between June 21 and August 1 when the season closed by regulation. The commercial catch of 2,790 chinook salmon in District 4 was the second largest on record. Based on deliveries, the run peaked between July 5 and July 14 (Table 9).

All subdistricts of District 5 opened by regulation on June 23. Subdistricts 5A, 5B, and 5C closed by emergency order July 6 and Subdistrict 5D closed by emergency order on July 14. Fishing was allowed during twice weekly 48-hour periods. A total of 3,286 chinook salmon were reported by commercial fishermen in District 5. In Subdistricts 5A, 5B and 5C, the total catch was 2,901 chinook salmon which exceeded the guideline harvest range of 2,400-2,800 fish. In Subdistrict 5D, the total catch was 385 chinook salmon which was within the guideline harvest range of 300-500 chinook salmon (Table 10).

As in 1988, Commercial Fisheries Division staff met with fishermen to discuss management of the District 6 fishery prior to the fishing season. It was decided that the opening of the commercial season on the Tanana River would be delayed by approximately two weeks from the date allowed by regulation (June 20). The intent of this strategy was to allow the early portion of the chinook salmon run to pass through the district prior to commercial fishing, in an attempt to ensure that chinook salmon escapement objectives in the Chena and Salcha Rivers would be met and thereby eliminate the need for mid-season closures. Chinook salmon in the Tanana River commercial fishery are considered to be incidental to the more abundant and (collectively) more valuable summer chum salmon. Therefore, it was considered preferable to implement a closure early in the season before summer chum salmon became abundant. This plan was implemented by emergency order, and staggered openings of the commercial season were scheduled as follows: Subdistrict 6-A on July 7, Subdistrict 6-B on July 10, and Subdistrict 6-C on July 14 (Table 11).

The commercial catch of 1,741 chinook salmon was allowed to exceed the guideline harvest range of 600-800 fish after escapement objectives in the Chena and Salcha Rivers were anticipated to be met.

Summer Chum Salmon

As in recent years, the summer chum salmon fishery in District 4 was predominantly a salmon roe fishery. A total of 283,305 pounds of salmon roe and 18,554 summer chum salmon were commercially harvested during twelve 48-hour fishing periods. Peak catches of summer chum salmon were made during the fishing period on July 9-11 which produced approximately 45,000 pounds of salmon roe (Table 9). An average roe weight of 0.9 pounds per female was calculated from data collected in 1988 and 1989. Therefore, approximately 316,000 female chum salmon were harvested. A field crew estimated that females made up 62% of the harvest, thus the total District 4 commercial related harvest was close to 510,000 summer chum salmon (Table 13). Due to roe prices, fish sold in-the-round were assumed to be all males. Of the remaining chum salmon captured during the

fishery, some were sold as dog food and some were retained by fishermen and used for subsistence purposes, but a large portion were unaccounted for.

Summer chum salmon are generally of poor quality and are not abundant in District 5. During the 1989 season, 154 summer chums and 373 pounds of roe were sold incidentally to the commercial fishery for chinook salmon (Table 10).

The summer chum salmon fishery in District 6 (Tanana River) occurred coincidental to the chinook salmon fishery. Between July 7 and August 9, ten 42-hour fishing periods occurred (Table 11). A total of 42,115 summer chum salmon and 4,871 pounds of roe were sold which was very similar to the 1984-1988 average.

Fall Chum and Coho Salmon

The summer chum and chinook salmon fishery in District 4 was closed on August 1 in order to evaluate the early portion of the fall run prior to allowing any commercial removal. Based on catches from the test fish wheel near Ruby and on subsistence catches, the run was judged to be as strong or stronger than anticipated. Accordingly, the commercial fishing season was reopened on August 6. Ten 48-hour periods were allowed prior to the season closure on September 12. The harvest of 11,776 fall chum salmon, 3,407 pounds of roe, and 3 coho salmon was taken by 20 fishermen in Subdistricts 4-B and 4-C (Table 9). There is no fall season commercial fishery in Subdistrict 4-A.

In Subdistricts 5-A, 5-B and 5-C, four 24-hour commercial fishing periods were allowed between August 12 and September 10. A total of 15,296 fall chum salmon, 3,596 pounds of roe, and 84 coho salmon were taken by 20 fishermen (Table 10). The fall commercial fishery in Subdistrict 5-D consisted of two 48-hour fishing periods (beginning on September 5 and September 10). Four fishermen harvested 2,919 fall chum salmon and 393 pounds of roe.

In District 6, contracted fishermen operated two fish wheels (one at Manley, one at Nenana) to provide in-season relative abundance and timing data for the second consecutive year. Although the database is limited, this information was useful for managing the fishery.

The initial commercial fishing period on September 1 and 2 was 24 hours in duration. Since available data (test fish catches, subsistence catches, and preliminary aerial surveys) indicated a surplus of fall chum salmon to be available, a fishing schedule of one 42-hour period per week was implemented.

The commercial harvest was 49,090 fall chum salmon in District 6, which was 2.8 times the 1984-1988 average. A total of 7,353 pounds of roe were sold, the most since 1978. The commercial coho salmon catch of 16,084 fish was a record harvest and was more than double the recent 5-year average. The commercial fishing season was closed prior to the regulatory closure date of September 30 due to concern for coho salmon escapements, Toklat River fall chum salmon escapement, and to provide for subsistence fishing since the majority of subsistence catches had not occurred by this date.

Escapement 1989

Comprehensive salmon escapement enumeration studies were conducted in 1989 on the Anvik, Chena, Salcha, Delta, Chandalar, and Sheenjek Rivers in the Alaskan portion of the drainage and on the Fishing Branch River and at the Whitehorse fishway in Yukon Territory, Canada. Studies at each of these locations were designed to enumerate or estimate the total population of spawners by a variety of methods.

Hydroacoustic techniques were employed to monitor chum salmon escapements to the Anvik, Sheenjek, and Chandalar rivers while replicate ground surveys and stream life data were used to estimate abundance of chum salmon spawners in the Delta River. A mark-and-recapture study was conducted by the Sport Fish Division to generate population estimates for chinook salmon spawners in both the Chena and Salcha Rivers. In addition, a new study in 1989 was undertaken in the Tanana River; a radio telemetry project designed to estimate the abundance of fall chum salmon bound for spawning areas upstream of Fairbanks.

Comprehensive escapement enumeration projects conducted by the Canadian Department of Fisheries and Oceans (DFO) included installation of a weir on the Fishing Branch River to enumerate chum salmon spawners, and manning an enumeration window and passage gate at Whitehorse to enumerate chinook salmon escapement.

In addition to the site specific studies mentioned above, the Department monitored salmon abundance by species in the mainstem Yukon River near Pilot Station (rivermile 123) by hydroacoustic methods. In Canada, DFO generated population estimates for both chinook and chum salmon entering Yukon Territory using mark-and-recapture techniques. Remaining escapement information throughout the Yukon River drainage was obtained primarily by aerial surveillance and occasional ground surveys.

Survey conditions in 1989 were extremely poor throughout the Alaskan portion of the Yukon River drainage during the chinook and summer chum salmon survey season from mid July through August. This was particularly so in that portion of the drainage downstream of the village of Tanana. Heavy rainfall created high and turbid water conditions resulting in less than acceptable survey conditions to most of this region. Consequently, only two streams were surveyed downstream of the village of Anvik while no acceptable surveys were conducted on streams lying between the villages of Anvik and Tanana. Survey conditions were slightly better in the Tanana River drainage permitting a few chinook and summer chum salmon streams to be surveyed.

By comparison, survey conditions were considered good for making aerial observations in the Canadian portion of the drainage during the chinook salmon spawning period. In that part of the upper Yukon River drainage, little rainfall and warm weather resulted in most non-glacial streams being low and clear while glacial streams were high and turbid. Smoke from wildfires did hinder aerial observations to a limited degree. All aerial index streams were successfully surveyed in this portion of the drainage in 1989.

Availability of survey aircraft together with inclement weather hindered aerial assessment of several fall chum and coho salmon spawning areas from late September through November in 1989.

Escapement estimates obtained in 1989 are shown in Table 17, while Figures 2 through 6 show major Yukon River tributary systems.

Chinook Salmon

Appendix Tables 33 and 34 present historic chinook salmon escapement data for selected streams during the period 1961-1989. Interim chinook salmon escapement goals have been established for eight streams in the Alaskan portion of the drainage: East (1,600) and West Fork (1,000) Andreafsky, Anvik (500), North (500) and South Fork (500) Nulato, Gisasa (650), Chena (1,700), and Salcha (3,500) Rivers (Table 18).² These escapement goals are based upon aerial survey counts which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions.

In 1989, the chinook salmon escapement to the East Fork Andreafsky River fell short of the objective by 200 fish, whereas, the escapement in the West Fork was approximately 100 fish above the objective. It is not known for certainty whether or not the Anvik River escapement objective (500) was achieved in 1989. Even though only 212 chinook salmon were observed in the index area used to assess escapements, the overall survey rating was poor due to adverse weather and water conditions. A total of 442 chinook salmon were estimated present in the entire drainage (mainstem plus tributaries) on that survey.

No assessment of chinook salmon escapements could be made to spawning streams between the villages of Anvik and Tanana in 1989.

The chinook salmon run to the Tanana River drainage as reflected by escapements in the Chena and Salcha Rivers was below average. Estimated escapement to each of these streams was below objective levels. Only 1,185 chinook salmon were observed in the index area for assessing escapements to the Chena River on a good survey conducted July 30 (approximately 500 fish shy of the objective). A total of only 1,280 were estimated on that survey throughout the entire drainage. The total estimated chinook salmon spawning population in the Chena River in 1989 based upon the mark-and-recapture study conducted by the Sport Fish Division was 2,730 fish.

Similarly, only 2,136 chinook salmon were observed in the Salcha River index area on July 30, which was below the interim escapement goal of 3,500. The mark-and-recapture population estimate made for chinook salmon spawners in the Salcha River in 1989 was only 3,572 fish.

² See Joint Canada/United States Yukon River Technical Committee (JTC) report dated November 14-16, 1988. Note that no interim escapement objectives have been established for individual Canadian spawning areas.

An estimated 79,362 chinook salmon migrated past the mainstem Yukon River sonar site at Pilot Station between the period June 8 and July 18 (Table 17). Pilot Station sonar data are subject to change as further analysis proceeds.

The population estimate of chinook salmon entering the Canadian portion of the mainstem Yukon River made by DFO was 42,620 in 1989. Subtracting the Canadian commercial and non-commercial harvest (17,419 excluding Old Crow) from this population estimate results in a total escapement estimate to Yukon Territory (excluding the Porcupine River drainage) of approximately 25,201 chinook salmon.

Aerial surveillance of selected major Yukon Territory chinook salmon spawning streams revealed relatively good escapements to most areas examined. Escapement to the Teslin River drainage as typified by observations in the Nisutlin River were the highest since 1984 and very similar to escapement observed in that year. Escapement to the Big Salmon River approached that observed in 1981, while escapement to the Little Salmon River was the highest observed in the past decade.

From a total of 549 chinook salmon returning to the Whitehorse fishway in 1989, only 331 were passed upstream to spawn. Forty-one females having an average fecundity of approximately 5,400 eggs were artificially spawned for hatchery brood stock. Of the remaining fish, 85 females and several males died at the Fishway from unusually high water temperatures (18° C).

Summer Chum Salmon

Appendix Table 35 presents historic summer chum salmon escapement data for selected streams during the period 1973-1989. Interim escapement objectives have been established for six major summer chum salmon spawning streams in the lower Yukon River drainage: East (109,000) and West Fork (116,000) Andreafsky, Anvik (487,000), North Fork Nulato (53,000), and the Hogatza (17,000: Clear Creek at 8,000 and Caribou Creek at 9,000) Rivers. With the exception of the Anvik River objective which is based upon total spawning abundance from hydroacoustic assessment, all other objectives are for aerial surveillance observations during periods of peak spawning.

Unfortunately, the very poor survey conditions encountered in 1989 severely limited escapement observations for summer chum salmon. A fair survey of the East Fork Andreafsky River revealed only 21,460 spawners present on July 27. The Anvik River sonar estimate of 636,906 chum salmon indicated the objective for that stream was met.

The only other index stream surveyed for summer chum salmon in 1989 was the Salcha River in the Tanana River drainage. It is not known whether the objective for that river (3,500 fish) was reached as the survey was made under poor viewing conditions. Only 1,574 chum salmon were estimated.

An estimated 1,622,000 summer chum salmon were estimated passing the Pilot Station sonar site during the period June 8 and July 18 in 1989.

Fall Chum Salmon

Appendix Table 36 presents historic fall chum salmon escapement data for selected streams since 1974. Total Yukon River fall chum salmon escapements are evaluated based upon escapement observations to four major spawning streams: Delta, Toklat, Sheenjek, and Fishing Branch Rivers. Interim escapement objectives for these four streams are 11,000, 33,000, 62,000, and 50,000 - 120,000 fall chum salmon, respectively. These are total abundance escapement goals for each of these streams based upon expansion of inseason point estimates. Thus, the total 4-area index escapement objective is currently 156,000 fall chum salmon. Additionally, an interim escapement objective of 90,000 - 135,000 spawners has been established for the upper mainstem Canadian Yukon River (excluding the Porcupine River drainage).³ However, the entire Yukon River objective is taken as twice the 4-area index objective, or 312,000 fall chum salmon. This figure allows for inclusion of spawning populations in the upper mainstem Yukon River (Yukon Territory), Chandalar River, upper Tanana River, and other areas where spawning occurs but is not monitored.

In 1989, the estimated escapement of 101,748 fish for the Sheenjek River was 1.6 times the objective of 62,000, while the Fishing Branch River escapement of 43,834 fish was just short of the lower end of the objective level of 50,000 spawners. The escapement estimate of 21,342 fish for the Delta River was almost double the established objective (11,000) for that stream. Fall chum salmon escapement to the Toklat River in 1989 was the highest observed since 1979, and was the first year estimated escapement to that river approached the objective level (33,000 fish) during the past decade. However, the 1989 escapement estimate (30,447 fish) still fell short of the objective by approximately 2,500 spawners.

The 4-area escapement index in 1989 totaled 196,015 fall chum salmon, exceeding the 4-area objective of 156,000 fish by approximately 40,000. Once again, strength of the Sheenjek River fall chum salmon escapement drove the 4-area escapement index as it has done for the past 9 years, particularly in 1985, 1986, and 1987. Escapement to this stream represented 52% of the 4-area total in 1989 and approximately 60% of the 4-area totals in each of 1985, 1986, and 1987.

A radio telemetry study was conducted during 1989 in an attempt to estimate the total abundance of fall chum salmon spawning in the upper Tanana River drainage (upstream of Fairbanks) as well as document the location of any presently unknown fall chum salmon spawning areas in that region. Although no population estimate is yet available, preliminary results suggest that numerous and smaller spawning areas in the mainstem river (compared to those in the Big Delta region), when taken collectively, may represent a more substantial contribution to Tanana River fall chum salmon spawning stocks than previously realized.

Comprehensive escapement enumeration of fall chum salmon on the Chandalar River was undertaken for the fourth consecutive year in 1989 by the USFWS. The sonar-

³ Interim fall chum salmon escapement objectives for Canadian spawning areas were established by the Canada/United States Yukon River Technical Committee (JTC) in October 1987.

estimated escapement was 69,161 fish; the highest observed in that river since hydroacoustic operations were initiated in 1986.

An estimated 684,840 fall chum salmon passed the main river sonar site at Pilot Station during the period of July 9 through September 11, 1989. The population estimate of fall chum salmon entering the Canadian portion of the upper Yukon River made by DFO was 55,861 fish. Subtracting the estimated Canadian commercial and non-commercial harvest (20,111 excluding Old Crow) from this population estimate results in a total escapement estimate to Yukon Territory (excluding the Porcupine River drainage) of approximately 35,750 spawners. This was one of the lowest escapement estimates for this area since DFO has conducted their mark-and-recapture studies (1982 through 1989, excluding 1984). The aerial estimate of spawners in the Kluane River was only 3,050, while 5,320 were estimated in the mainstem Yukon River spawning areas between Fort Selkirk and Tatchun Creek.

Summation of the 1989 fall chum salmon inriver commercial and subsistence harvests of 528,738 together with estimated spawning escapement of 394,742 (the 4-area escapement index doubled) reveals total run size as approximately 923,480 fish. The fall chum salmon pre-season projection for 1989 was 861,000.

Coho Salmon

Escapements of coho salmon to index areas examined in the Tanana River in 1989 were about average (Appendix Table 37).

Enforcement 1989

The primary enforcement authority for violation of Fish and Game regulations is the Division of Fish and Wildlife Protection within the Department of Public Safety. For purposes of enforcing commercial and subsistence fishing regulations within the Yukon River drainage, the Division of Fish and Wildlife Protection has employees permanently stationed in McGrath, Aniak, Galena, Coldfoot, and Fairbanks. During the fishing season, officers are stationed in a temporary camp near the Dalton Highway bridge and at other locations along the Yukon and Tanana Rivers.

Lower Yukon Area

Fish and Wildlife Protection officers based out of the McGrath and Aniak offices conducted periodic aerial patrols of the Lower Yukon Area during June and July. A total of 9 citations were issued (three for not having buoys marked with CFEC number, 1 for subsistence fishing during a closed period, three for commercial fishing during a closed period, and two for fishing in a closed area). Fish and Wildlife Protection did not conduct patrols during the August commercial fishery.

Upper Yukon Area

During the 1989 season, Fish and Wildlife Protection officers made periodic patrols in the Upper Yukon Area. No information is available regarding the type or number of citations issued.

OUTLOOK FOR 1990

Chinook Salmon

The majority of chinook salmon returning to the Yukon River are 6-year old fish, however, 5 and 7-year old fish make a significant contribution to the run. In general, spawning ground escapements in 1984, the primary brood year (age 6 in 1990), were judged to be average in magnitude. Survival and production of the 1984 brood year is apparently average based on observation of a normal contribution of 5-year old fish to the 1989 commercial catch. It is expected that the 1990 return of 5-year-olds (1985 brood year) will be average based on near average escapements during 1985 and average proportion of 4-year old fish in the 1989 commercial catch. The return of 7-year old fish (1983 year class) is expected to be average, as the return of this year class in 1988 as 5-year olds, and in 1989 as 6-year olds was average. Overall, the 1990 chinook salmon return is anticipated to be average in strength. The commercial harvest in Alaska is expected to total 85,000 to 107,00 chinook salmon (80,000-100,000) fish in the Lower Yukon Area, 5,000-7,000 fish in the Upper Yukon Area).

Summer Chum Salmon

Summer chum salmon return primarily as 4-year old fish, although substantial 5-year old returns often result from brood years with high survival rates. The return of 4-year old fish in 1990 will be dependent on production from the 1986 brood year and survival of the resulting cohort. Based on available catch and escapement data, the magnitude of the 1986 summer chum salmon run was judged to be above average in abundance. In addition, the return of 5-year old fish in 1990 is expected to be above average in strength based upon the above average return of 4-year old fish in 1989. The Anvik River summer chum salmon stock is expected to be the primary contributor to the 1990 return. In summary, based on evaluation of brood year run size data and assuming average survival, it is expected that the Yukon River summer chum salmon return in 1990 will be above average in magnitude. The commercial harvest is expected to be 800,000-900,000 fish and approximately 200,000 pounds of roe.

Fall Chum Salmon

Similar to summer chum salmon, fall chum salmon return primarily as 4-year old fish. Escapements in 1986 (the brood year which will produce 4-year old fish in 1990) ranged from below objective levels in the Tanana River drainage and Fishing Branch River to about average levels in other streams. The contribution of age 3 fall chum salmon in the 1989 return was below average which, when combined with available escapement data, suggests a below average to average return of 4-year-

olds in 1990. The return of 5-year old fish (1985 brood year) is expected to be above average overall based on the strong contribution of age 4 fall chum salmon in the 1989 harvest and above average escapements in the majority of systems in 1985. In summary, based on evaluation of brood year escapements and assuming average survival rates, the overall fall chum salmon return is expected to be average in 1990. The commercial harvest is anticipated to be near 200,000 fall chum salmon (approximately 140,000 in the Lower Yukon Area and 60,000 fall chum and coho salmon combined in the Upper Yukon Area).

A more comprehensive analysis of fall chum salmon information including estimates of total return sizes, maturity schedule and return per spawner data resulted in a return projection of 784,000 fish. The current drainage-wide escapement objective using this method is 312,000 fall chum salmon. The recent five year average (1984-1988) drainage-wide subsistence harvest was approximately 191,000 fish. Thus, a total of 281,000 fall chum may be available for commercial fisheries (including Canadian harvests). However, with a relatively poor return to the Tanana River drainage anticipated, and the mixed stock nature of the fisheries, the commercial harvest will probably not reach this level in order to achieve escapement objectives.

Coho Salmon

Coho salmon return primarily as 4-year old fish. Comprehensive escapement information for coho salmon is lacking, but escapement surveys in the Tanana River system indicated average run strength in 1986. The commercial harvest is expected to be 30,000-60,000 fish and will be dependent on the timing and frequency of fishing periods allowed for fall chum salmon.

CAPE ROMANZOF DISTRICT HERRING FISHERY

Commercial Fishery 1989

The Pacific herring commercial fishing season consisted of four periods which were established by emergency order during May 26-27 and May 29-30 for a total fishing time of 13 hours. A total harvest of 925.9 short tons (st) was made by 115 fishermen utilizing 110 fishing vessels (Table 19). The entire harvest was taken from Kokechik Bay.

The majority of the harvest was taken as sac roe; only 1.0 st was bought as bait. Average roe recovery was 9.3%. Wastage of Pacific herring was not a problem; however, several nets were lost during the season.

Estimated value of the total harvest to fishermen was \$486,500. Average price for Pacific herring sac roe was \$560 per st at 10% roe recovery plus or minus \$56.00 a percentage point. Six processors purchased herring in the Cape Romanzof District, the same as in 1988 (Appendix Table 41). A total of 115 fishermen participated in the fishery, the second highest on record and 1.8% above the 1988 effort level. Approximately 87% of the effort was by local fishermen. Local

fishermen are defined as residents of Hooper Bay, Chevak, and Scammon Bay. The local fishing fleet accounted for 82% of the total harvest.

The overall exploitation rate of Pacific herring was estimated to be approximately 21% of the available biomass. Age composition information indicated age 8 and older Pacific herring comprised approximately 79.9% of the total harvest. Age 4 and age 5 herring comprised approximately 0.1% and 0.4% of the harvest, respectively.

In coordination with the Department, commercial fishermen provided catch samples for evaluation by industry representatives prior to each opening. Roe recovery information indicated that 100% of the Pacific herring sampled were mature. Roe recovery of fish captured in 3 inch mesh size gill nets was in excess of 13%, while roe recovery from fish captured in 2 7/8 inch mesh size gill nets was 7.5 - 16.0%, and fish from 2 3/4 inch mesh size gill nets was 8.2 - 13.5%. Low roe recovery samples were the result of catches with high male ratios obtained primarily in offshore sets. Following evaluation of roe quality, the fleet was typically given 2 hours notice prior to the beginning of each commercial fishing period. The first three periods were scheduled to start at approximately high tide. The last period was initiated approximately 1 hour prior to high tide. This was the first season in which commercial fishery test samples were extensively utilized for management purposes. Participation of fishermen in collecting samples, processor evaluation of samples, and flexibility of fishermen to fish on short notice resulted in obtaining an optimum roe recovery.

Four Fish and Wildlife Protection (FWP) officers were present on the Cape Romanzof fishing grounds during the 1989 Pacific herring commercial fishing season. These officers were supported by the Protection Vessel (P/V) Wolstad and two skiffs. A total of nine commercial fishing citations were issued, in addition to two hunting citations. The commercial fishing citations were issued for fishing during closed periods (7), and lack of photo identification (2). One delivery of 1,443 lbs of Pacific herring and one shackle of gear was confiscated. Poor weather conditions during the second opening prevented FWP officers to be present on the fishing grounds in their skiffs; however, the P/V Wolstad was present. No FWP support or personnel was present during the third and fourth openings. This lack of enforcement was an obvious problem as evidenced by several observed violations during the last fishing period. Approximately eight gill nets were in the water in front of the ADF&G camp after the fishing period closed. One of these nets was fishing for 1/2 hour after the closure.

Subsistence Fishery 1989

A subsistence harvest estimate of 2 st of Pacific herring was reported to have been taken by 19 fishing families from Hooper Bay, Chevak, and Scammon Bay (Appendix Table 42). The subsistence harvest survey was conducted through the mail by a catch questionnaire. About 15% of the questionnaires were returned. Approximately 50% of the fishermen that responded to questionnaires reported less herring were present during 1989, than during other recent years. This may have been a function of subsistence fishing occurring later in the run than normal. The subsistence catch figures represent only the harvest which was reported. Therefore, the reported catch is a minimum estimate since not all families were

mailed questionnaires and not all families which received questionnaires returned them.

Herring Abundance

Aerial surveys were flown during the 1989 season on May 24, 25, 26, and 30. During all surveys turbid water prevailed within Kokechik and Scammon Bays. One survey was conducted utilizing a helicopter provided by industry representatives. Approximately 3.04 st of Pacific herring were observed under unsatisfactory survey conditions on May 24. Several large schools were observed in Scammon Bay on May 26, but no biomass estimate was obtained.

Test fishing was conducted from May 22 to June 3. A total of 2,003 Pacific herring were caught, of which 451 samples were used for test fishing data. The remainder of the fish captured were sampled as part of an Eastern Bering Sea stock identification study. Pacific herring comprised approximately 98.0% of the total catch of schooling species. The commercial harvest was sampled during all four openings. A total of 866 Pacific herring were sampled from this harvest.

It was not possible to achieve a Pacific herring spawning biomass estimate based on aerial surveys due to turbid water conditions during 1989. Evaluation of spawn deposition surveys, test fishing, and age composition data from test and commercial catches resulted in a Pacific herring biomass estimate of 4,400 st. Approximately 20% of the 1989 biomass was composed of age 8 herring. Age 9 and older herring comprised 54% of the biomass. Recruits, age 3, 4, and 5 Pacific herring represented 9% of the biomass.

Ground surveys indicated spawn deposition occurred from May 24 until at least termination of the project. Heavy snowfall, cold temperatures, and a large amount of ice in Kokechik Bay affected the timing of spawning. Shore ice covering many spawning areas also delayed deposition. The first indication of spawn deposition occurred on May 24, five days later than in 1988. A large storm on May 28 increased egg mortality by eroding eggs from the rock or fucus substrate. Spawn deposition occurred over an extended duration and averaged between 1 and 2 egg layers in primary spawning areas.

Outlook 1990

Emergency order authority will be used to adjust the occurrence and length of fishing periods. It is very likely that gear will be restricted to one 50 fathom gill net per vessel. A minimum level of biomass cannot be used to determine the timing and duration of commercial fishing periods since turbid water conditions usually preclude aerial biomass assessments. Therefore, test and commercial catch rates and spawn deposition observations will be used to determine timing and duration of commercial fishing periods. Projected return for 1990, based upon limited information is 2,410 st. Since the stock appears to be exhibiting a trend of decreasing abundance, a 15% exploitation rate will be used to manage the fishery in 1990. The projected harvest is approximately 360 st. Average harvest for the period 1980-1989 was 1,054 st.

COMMERCIAL FRESHWATER FISHERIES

Regulations adopted by the Alaska Board of Fisheries allow the Department of Fish and Game to issue permits for the commercial harvest of freshwater species of fish such as whitefish, sheefish, char, trout pike, blackfish and lamprey. Permit authorization is not required for the sale of these species when taken incidentally during commercial salmon fishing.

Commercial fisheries for species other than salmon have been allowed in widely scattered locations throughout the Yukon and Tanana River drainage and in the Colville River on the North Slope; most of these fisheries are limited, experimental operations, and occur only sporadically.

A commercial fishery for whitefish has existed in the Colville River delta (located approximately 60 miles west of Prudhoe Bay) since 1964. Fishing generally takes place during late June and July for broad and humpback whitefish, and October through early December for arctic and least cisco. Set gill nets (of 3 and 5 inch mesh) are used as capture gear, and fishing during fall months occurs under the ice (Appendix Table 43).

In the Upper Yukon Area, set net fisheries targeting on whitefish have been permitted in recent years in Lake Minchumina and Healy Lake. Catch data are presented in Appendix Table 44.

Numerous other permits allowing limited harvests of whitefish, primarily for the Upper Yukon Area, have been issued. In most cases, commercial harvests have not occurred.

Permits for the taking of non-salmon species have been issued for various locations in the Lower Yukon Area. Reported harvests for those fisheries are presented in Appendix Table 45. Although a few permits were issued in 1989, no harvest occurred. Set gill nets are primarily used for taking whitefish and sheefish in the Lower Yukon Area. Typically, the catch is marketed in local village stores or Bethel.

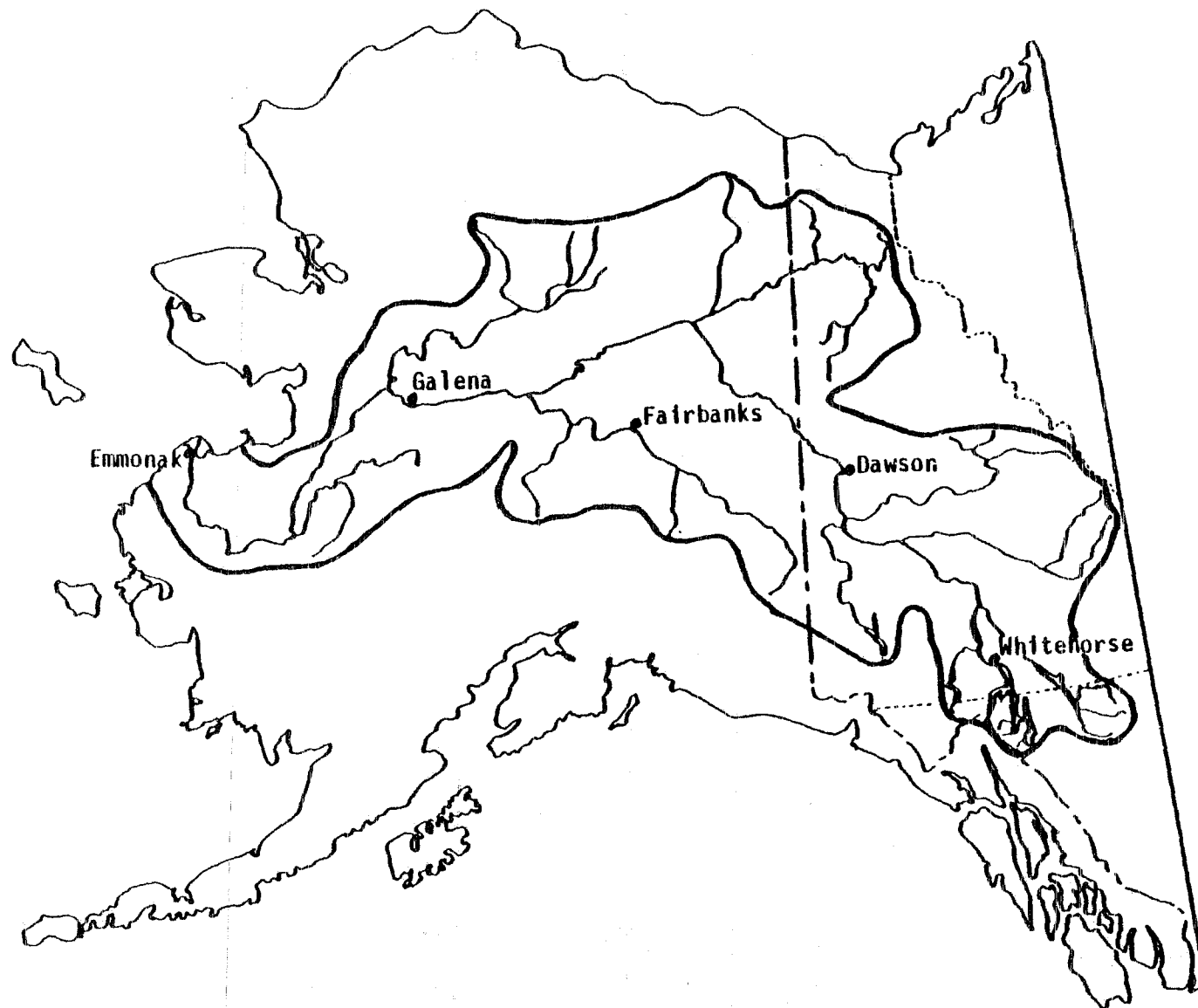


Figure 1. The Yukon River drainage, 330,000 square miles.

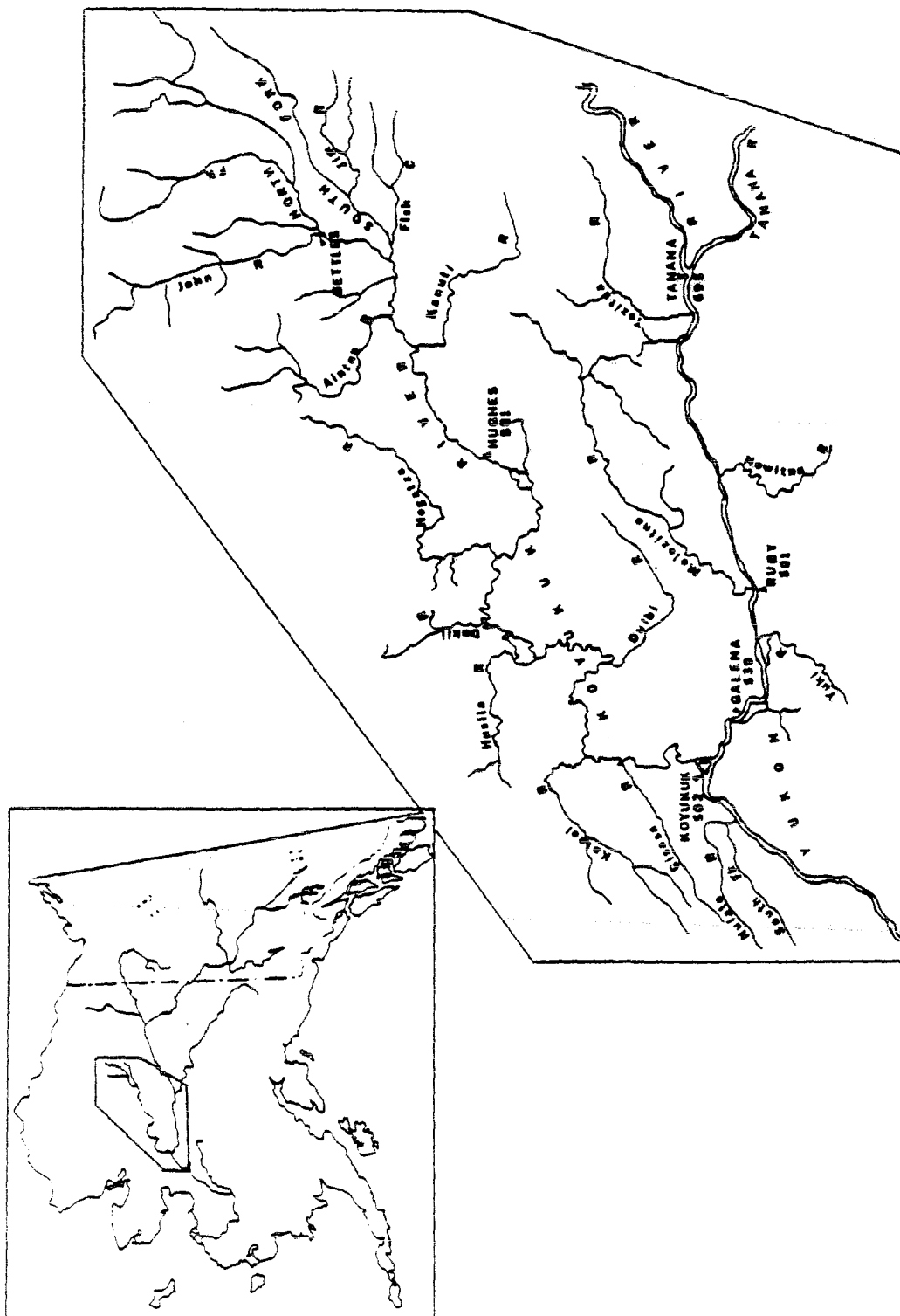
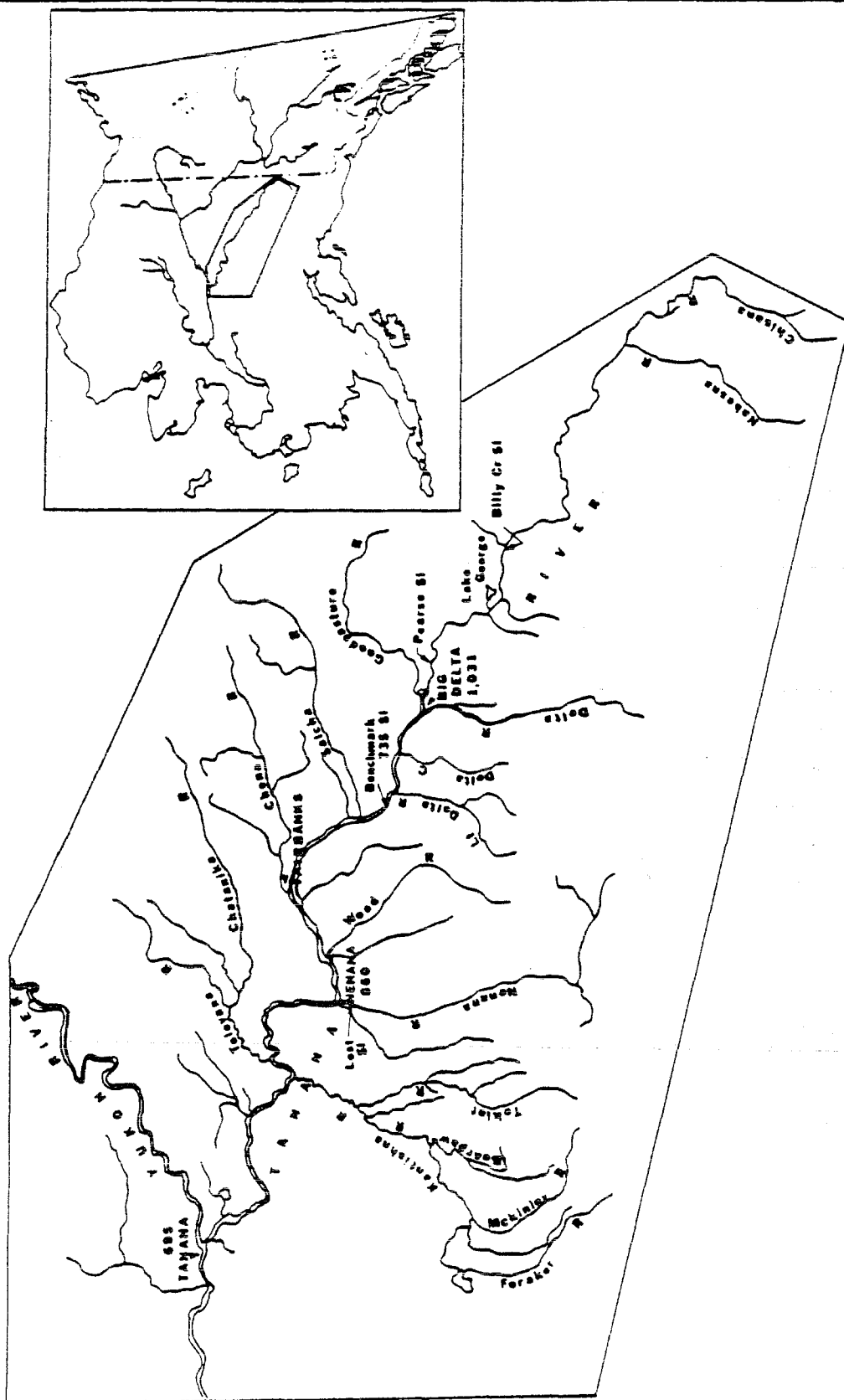
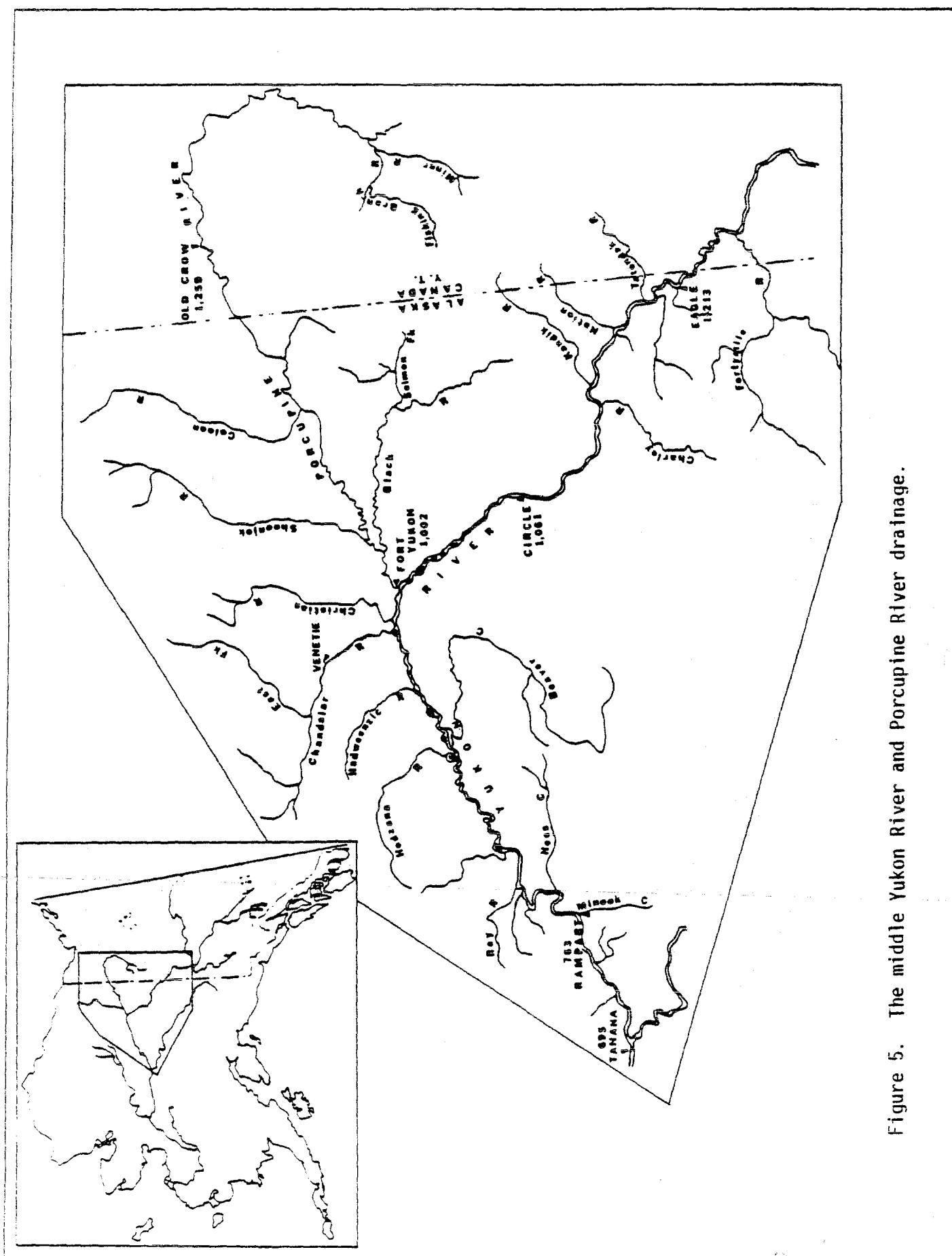
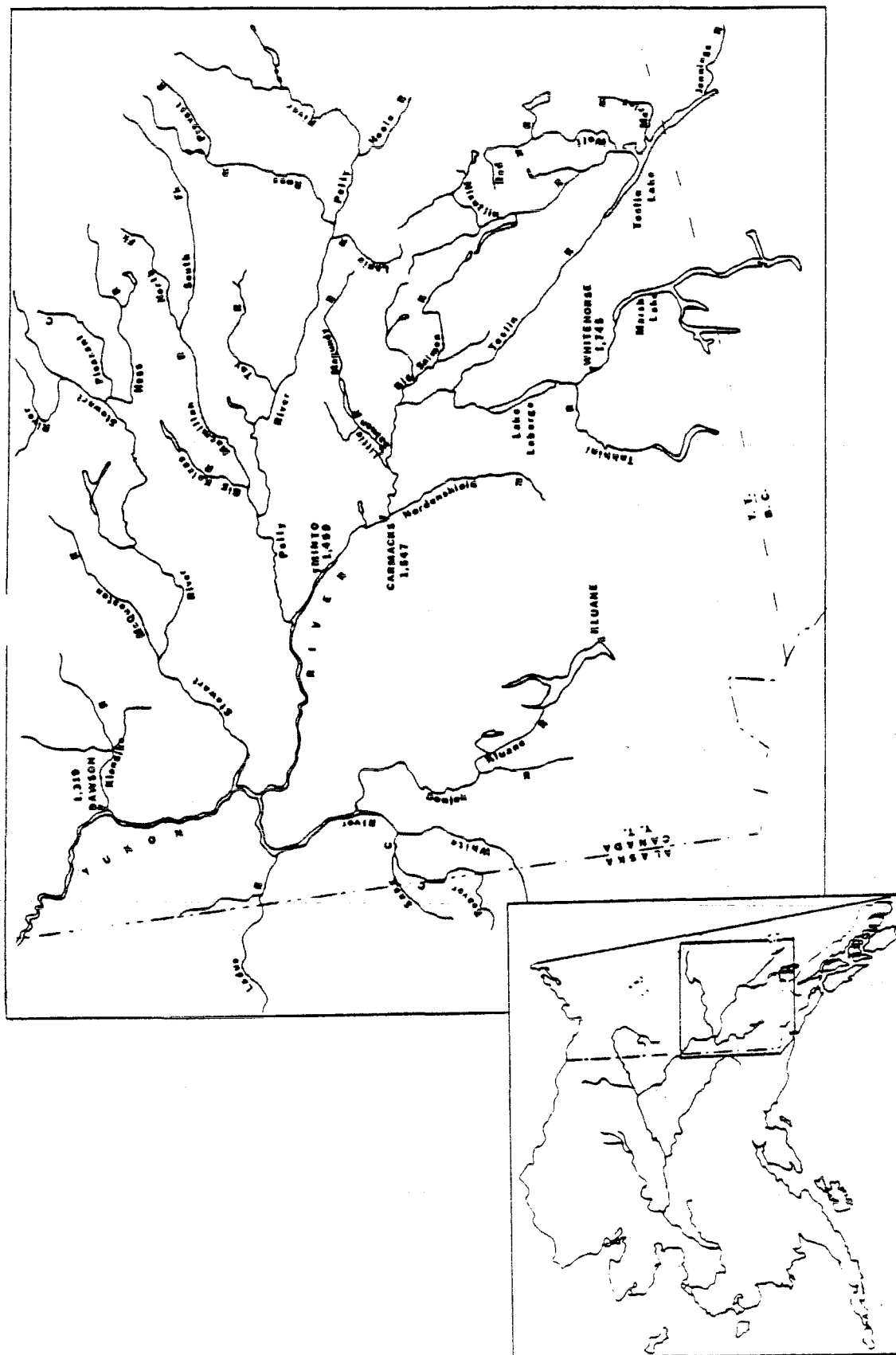


Figure 3. The Koyukuk River drainage.







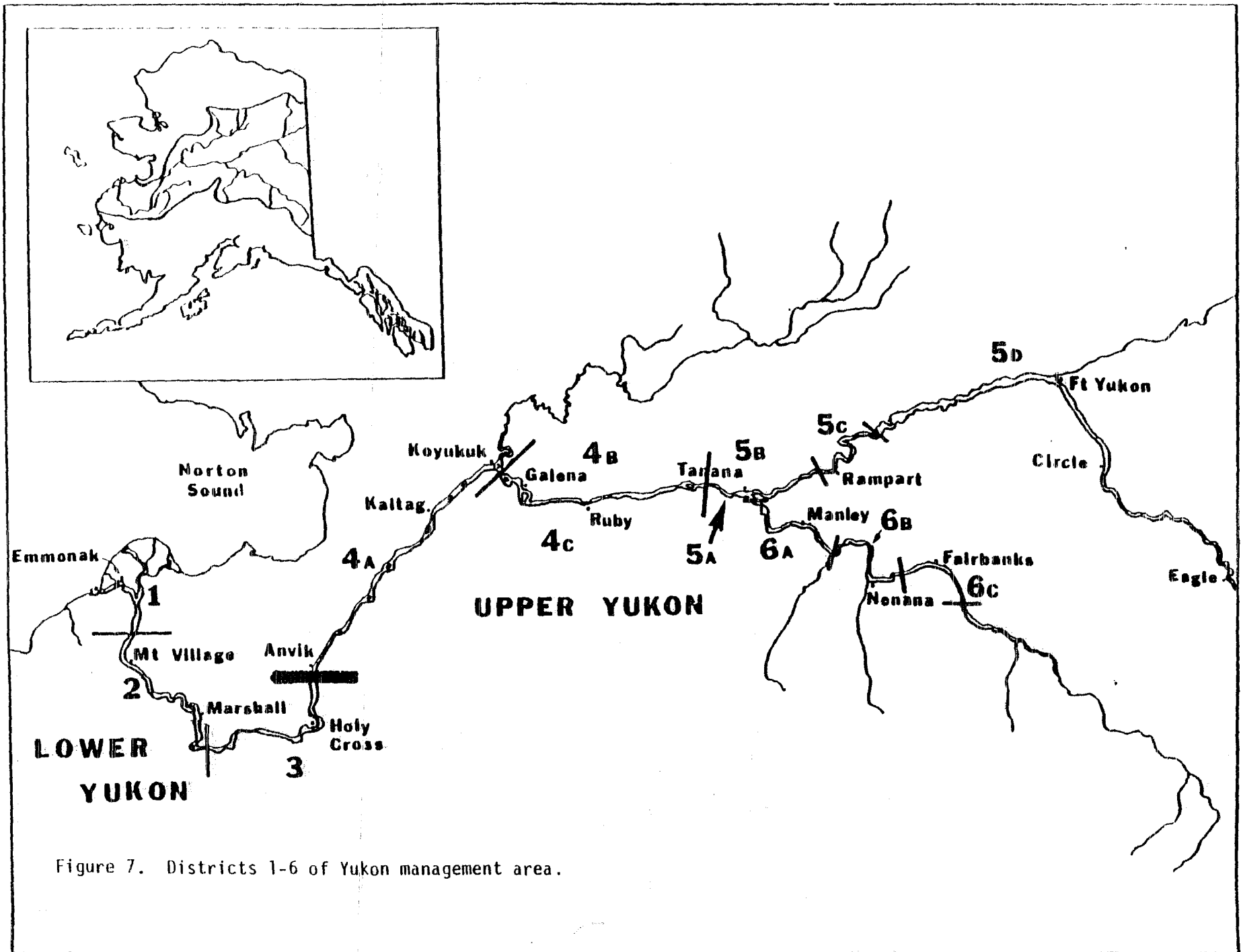
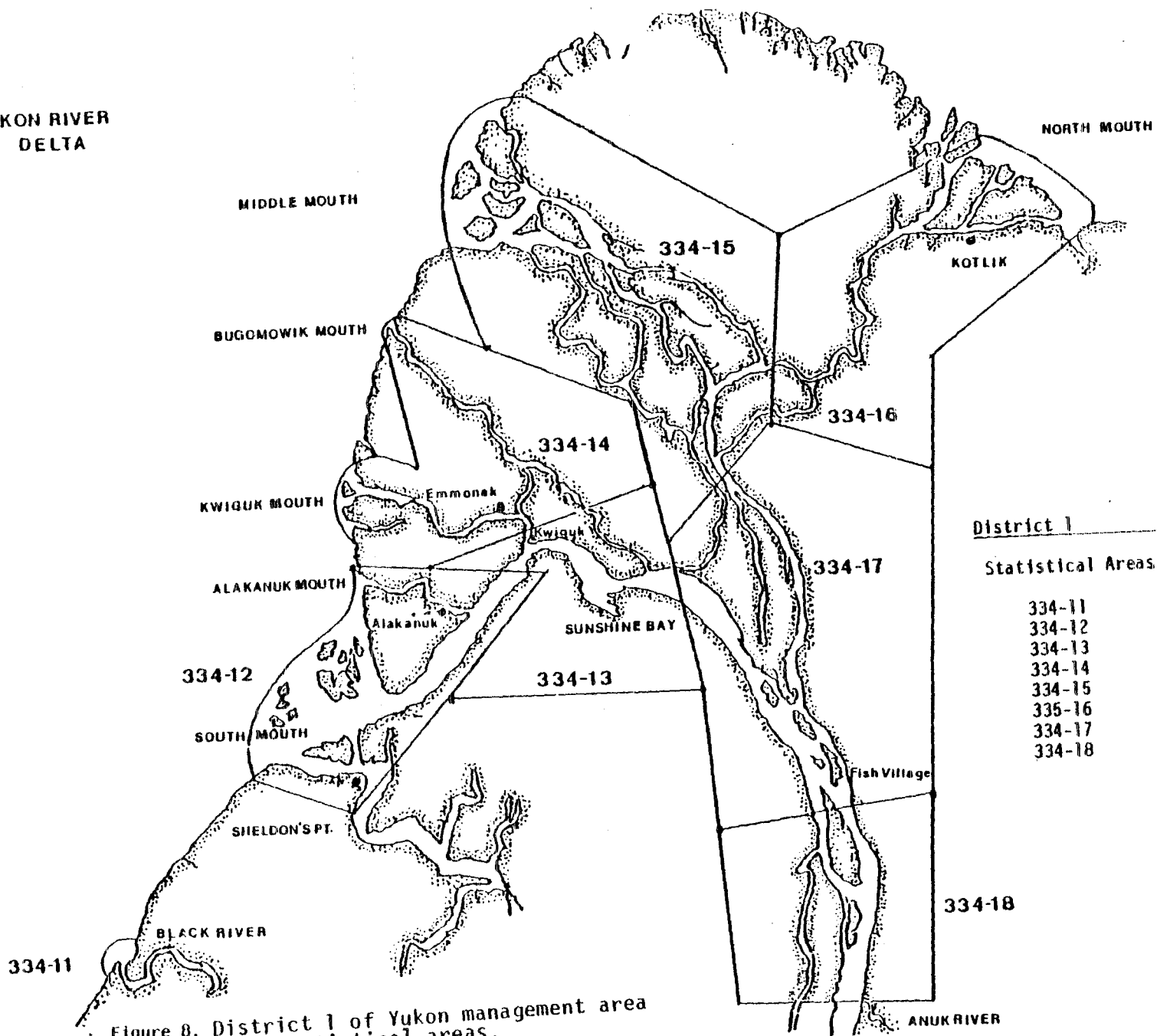


Figure 7. Districts 1-6 of Yukon management area.

YUKON RIVER DELTA

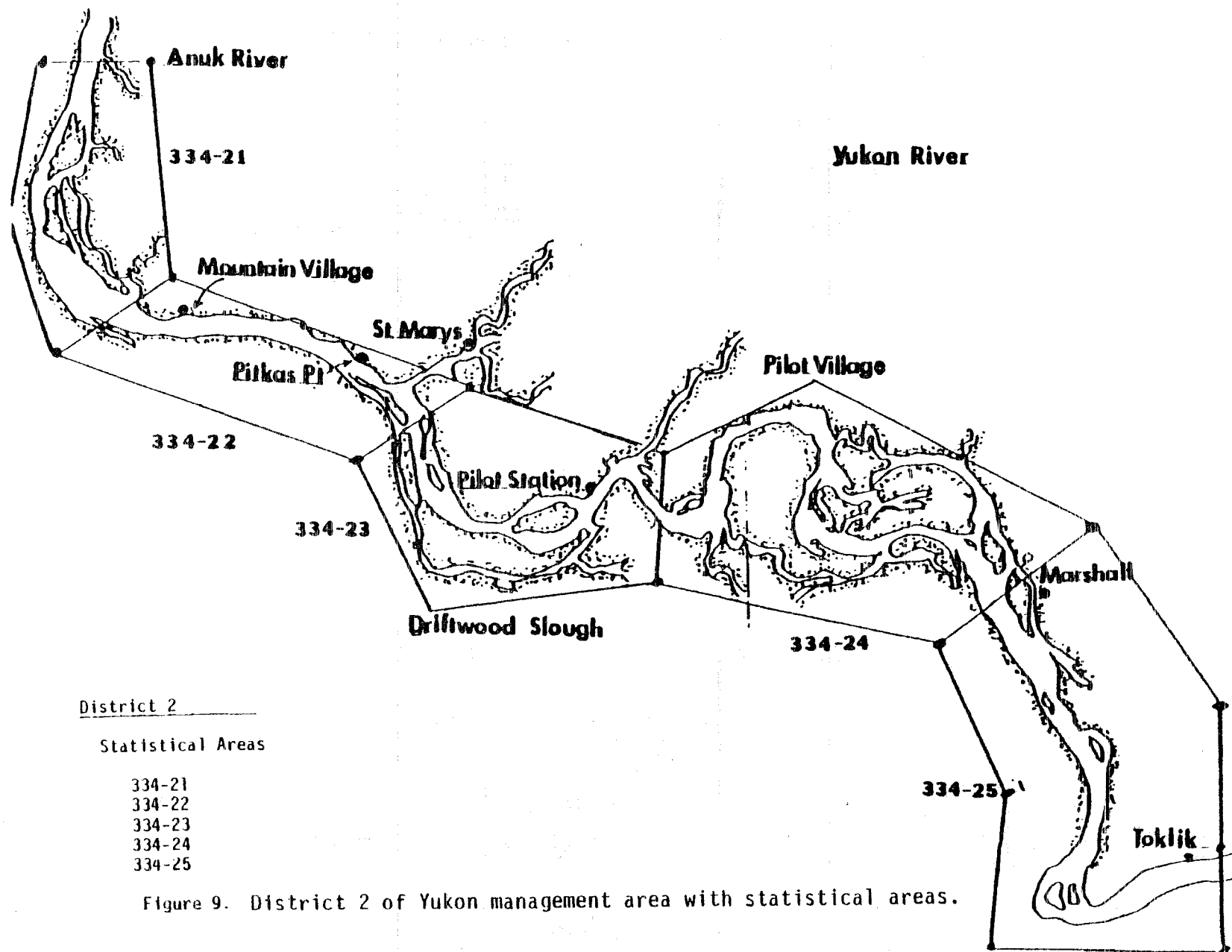


District 1

Statistical Areas

334-11
334-12
334-13
334-14
334-15
335-16
334-17
334-18

Figure 8. District 1 of Yukon management area with statistical areas.



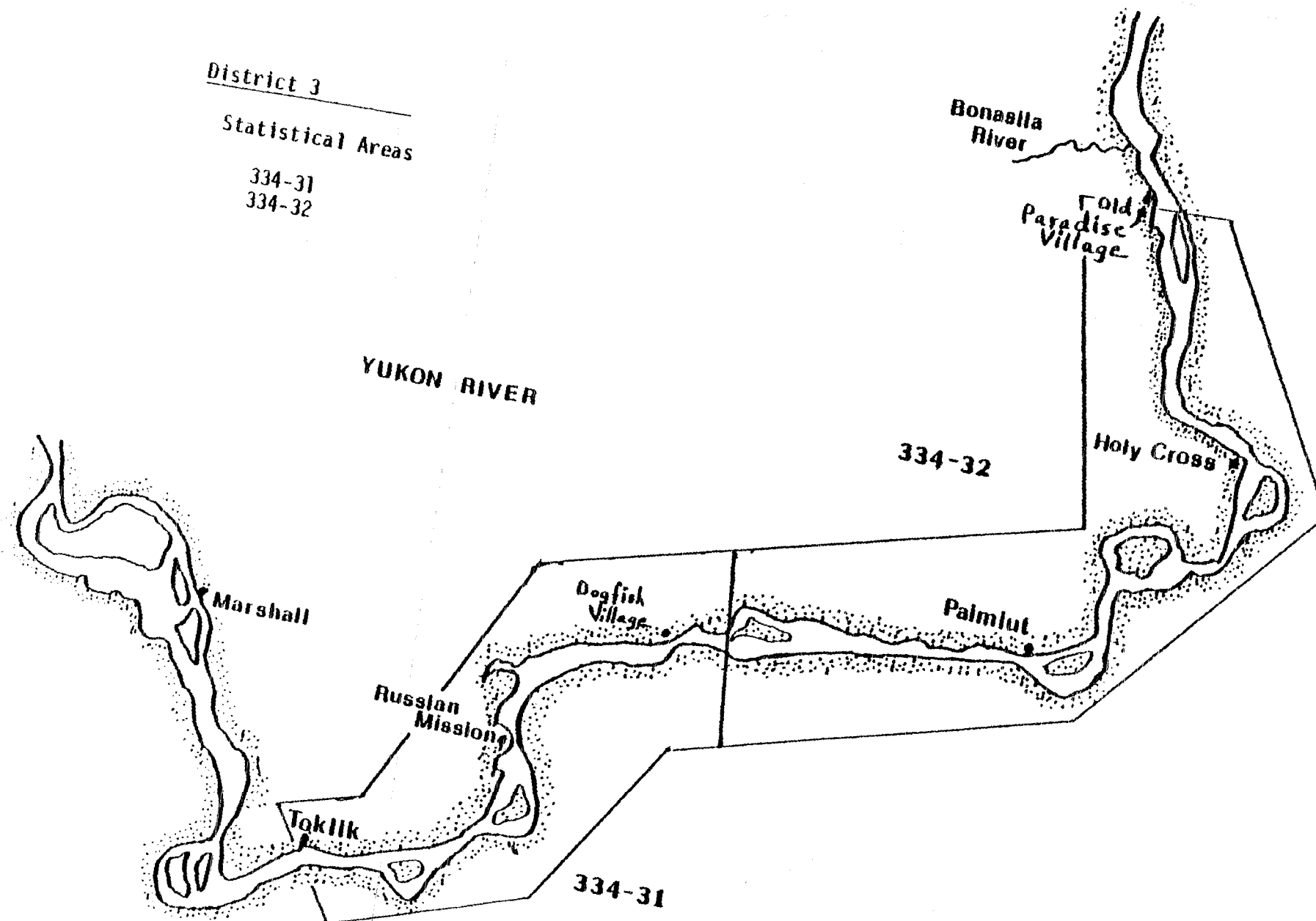


Figure 10. District 3 of Yukon management area with statistical areas.

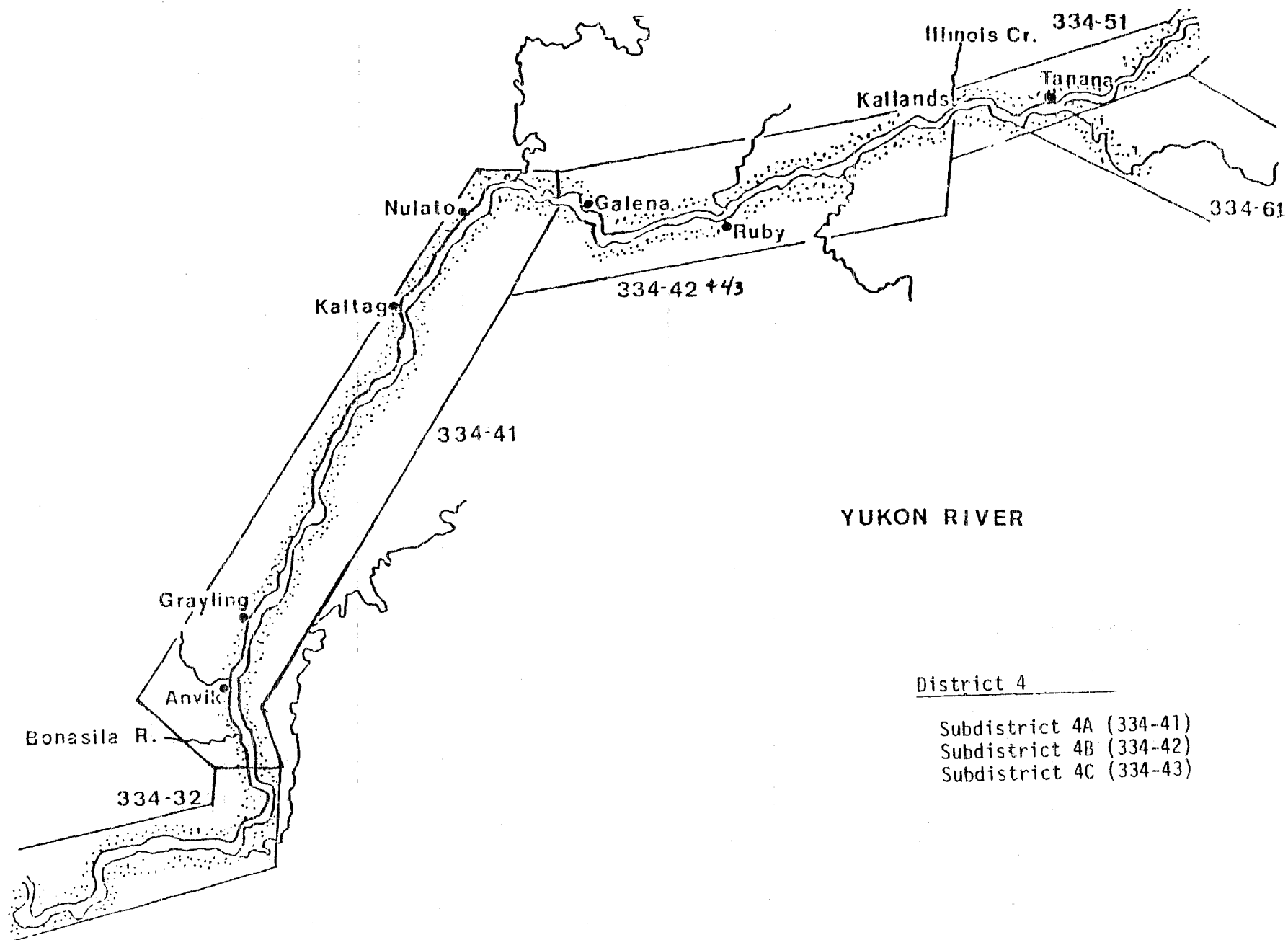


Figure 11. District 4 of Yukon management area with statistical areas.

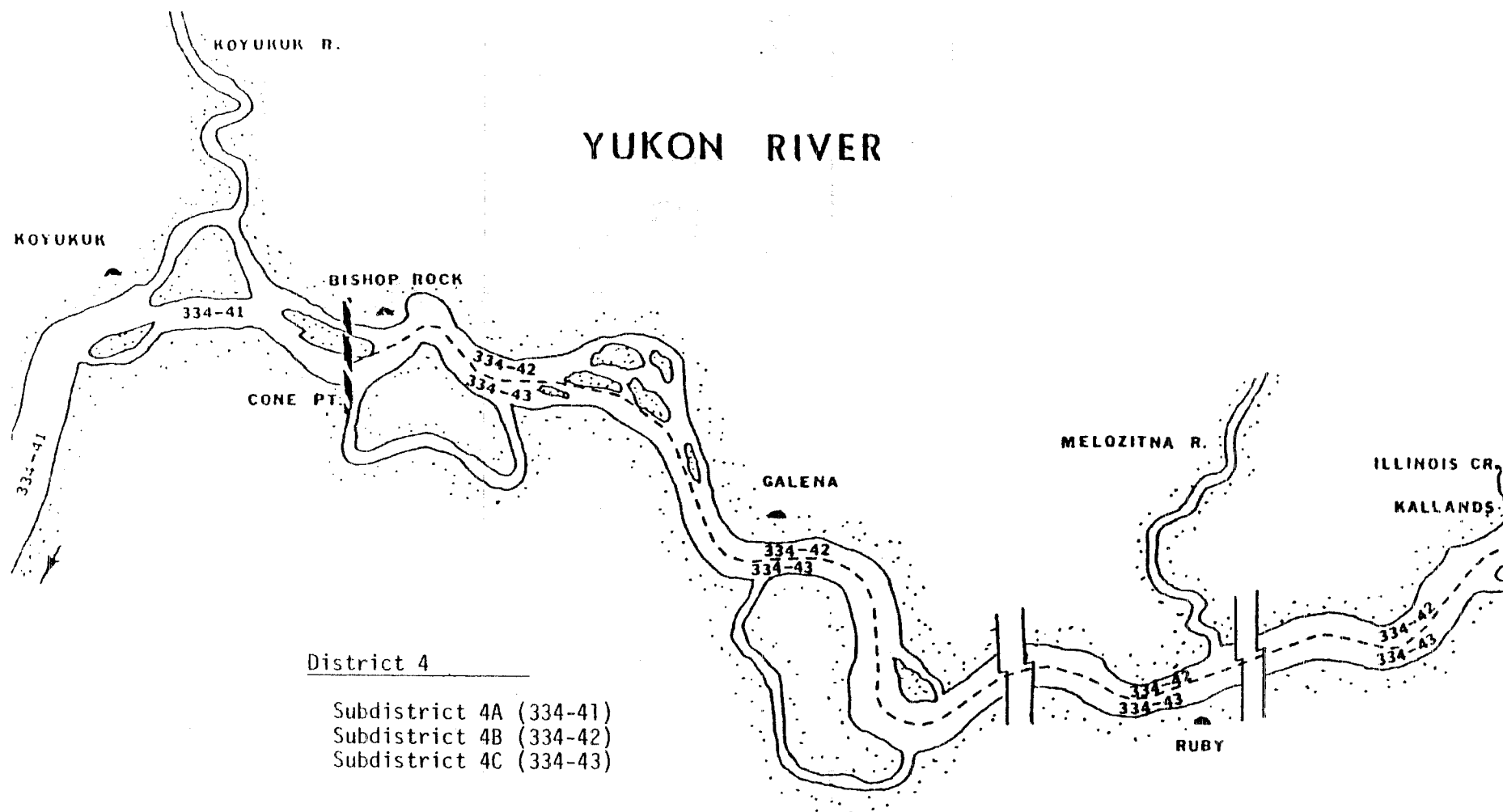


Figure 12. District 4 of Yukon management area with statistical areas.

District 5:

Subdistrict	5A	(334-51)
Subdistrict	5B	(334-52)
Subdistrict	5C	(334-53)
Subdistrict	5D	(334-54)

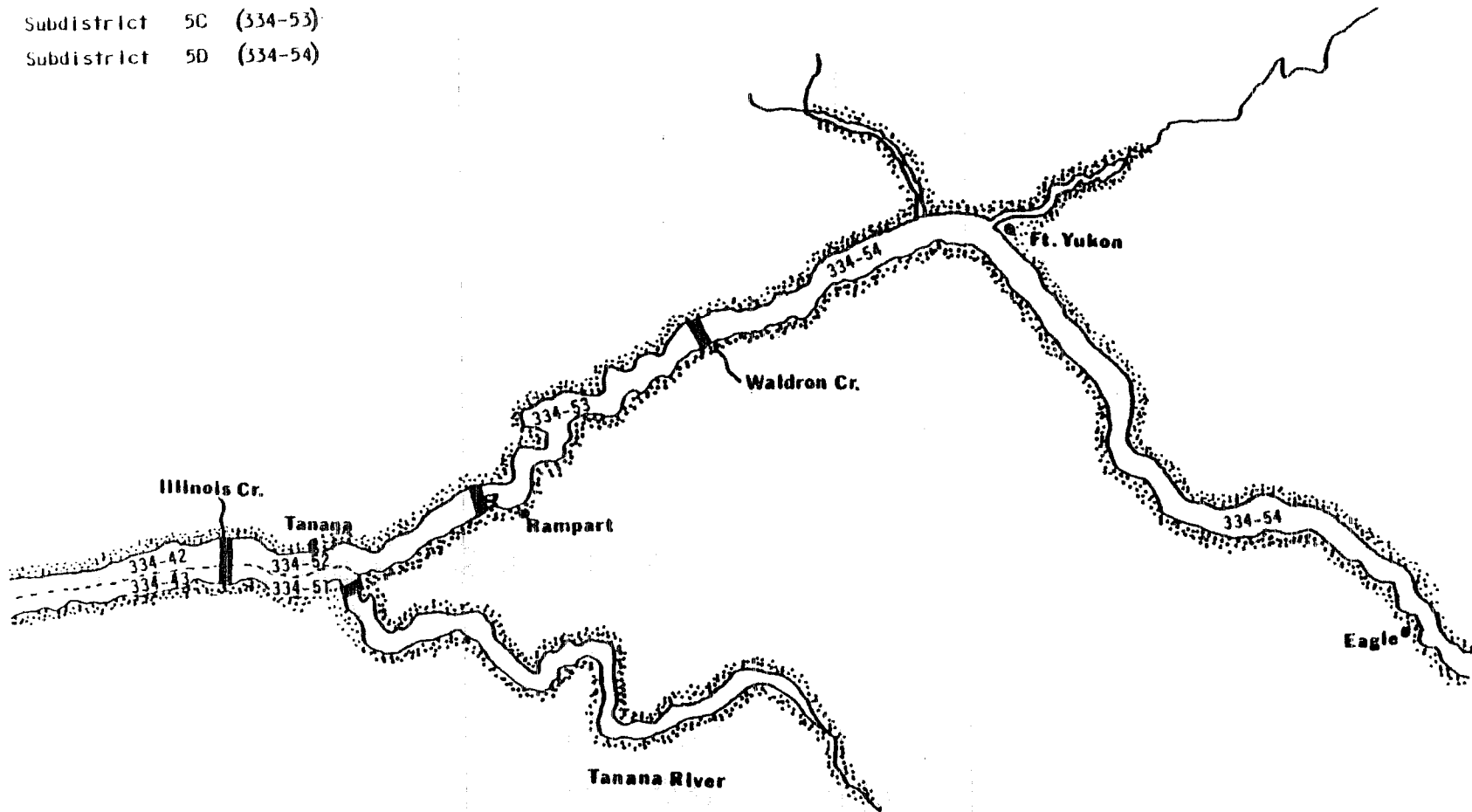


Figure 13. District 5 of Yukon management area with statistical areas.

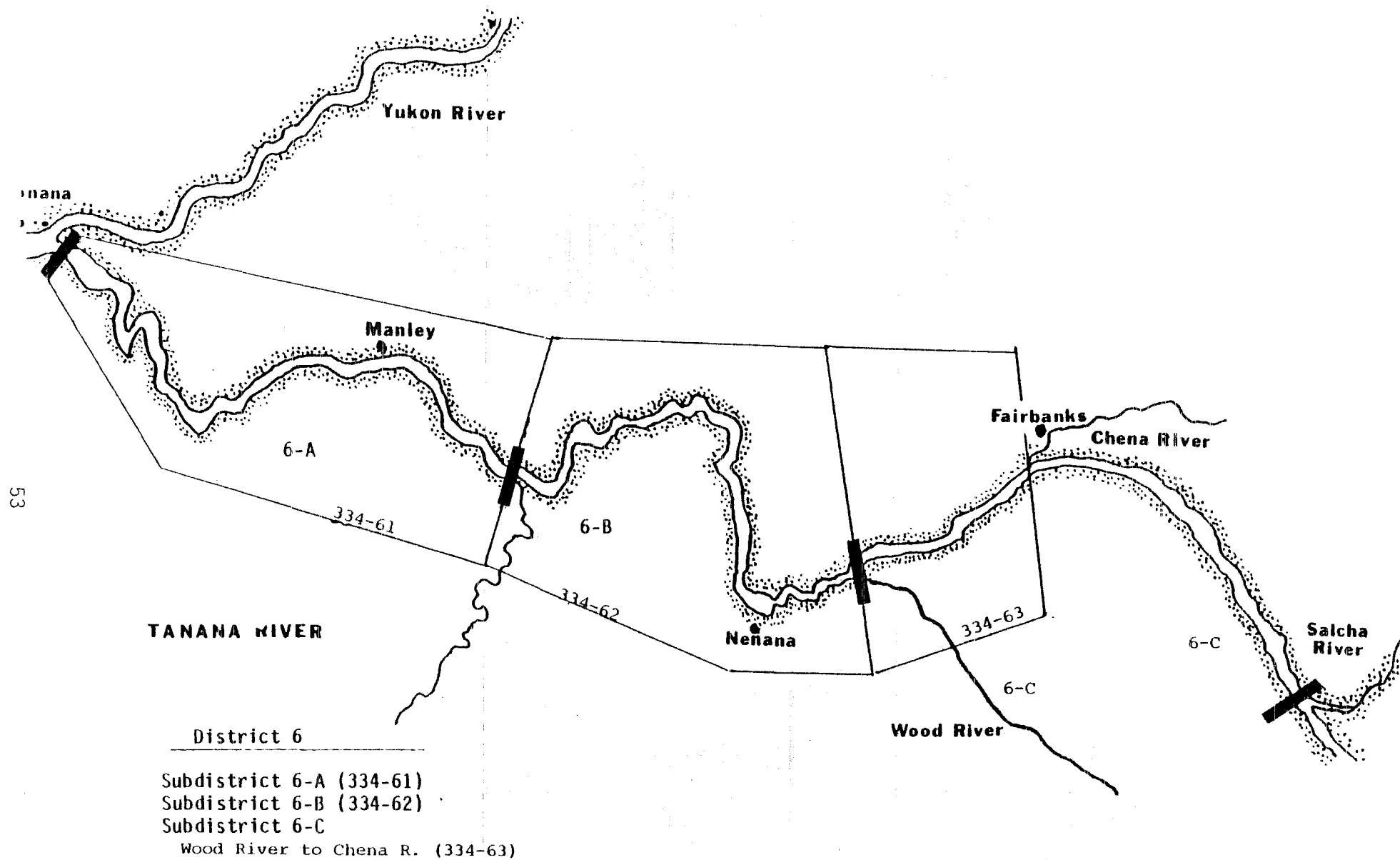


Figure 14. District 6 of Yukon management area with statistical areas.

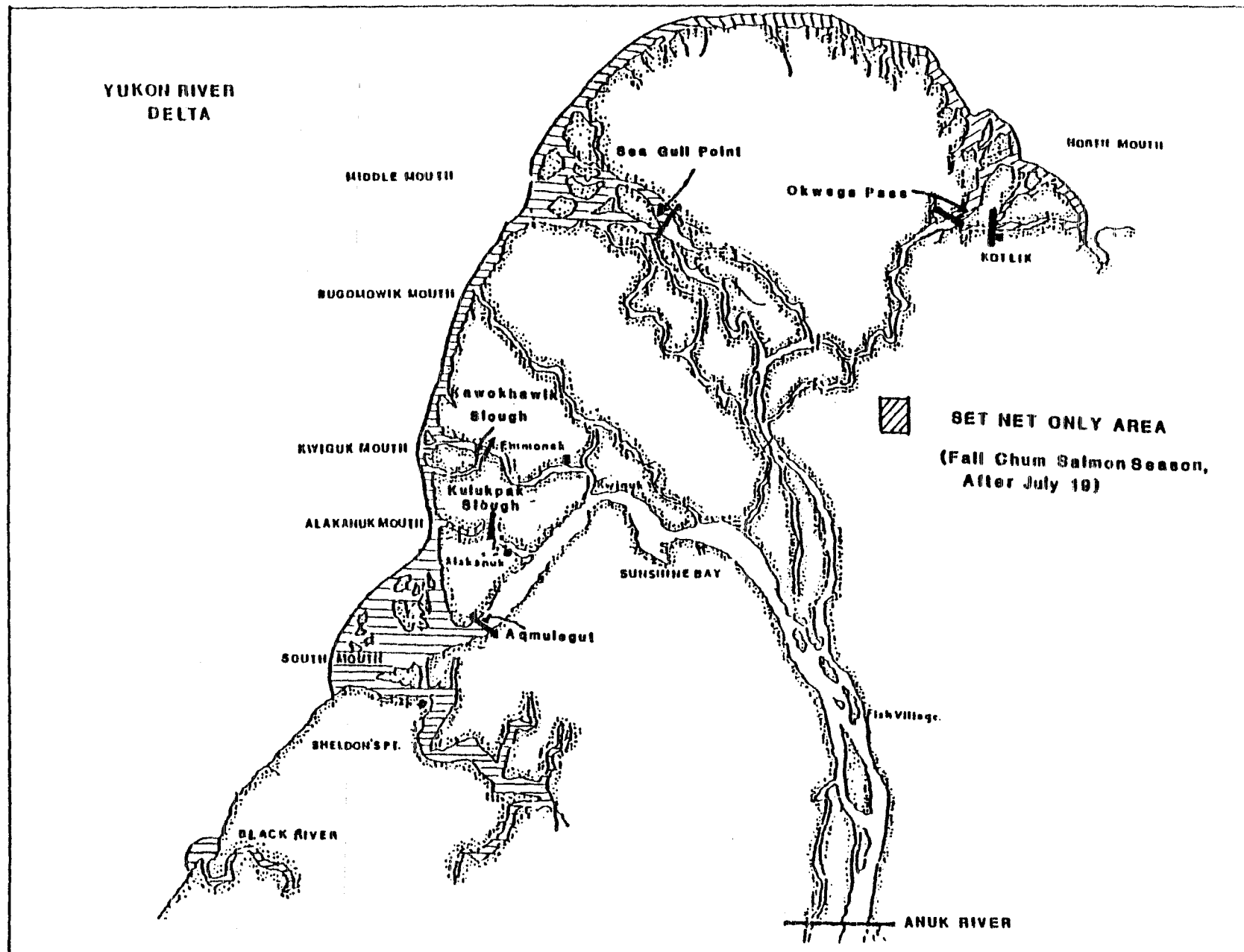


Figure 15. Set net only area, District 1 of the Yukon Management Area.

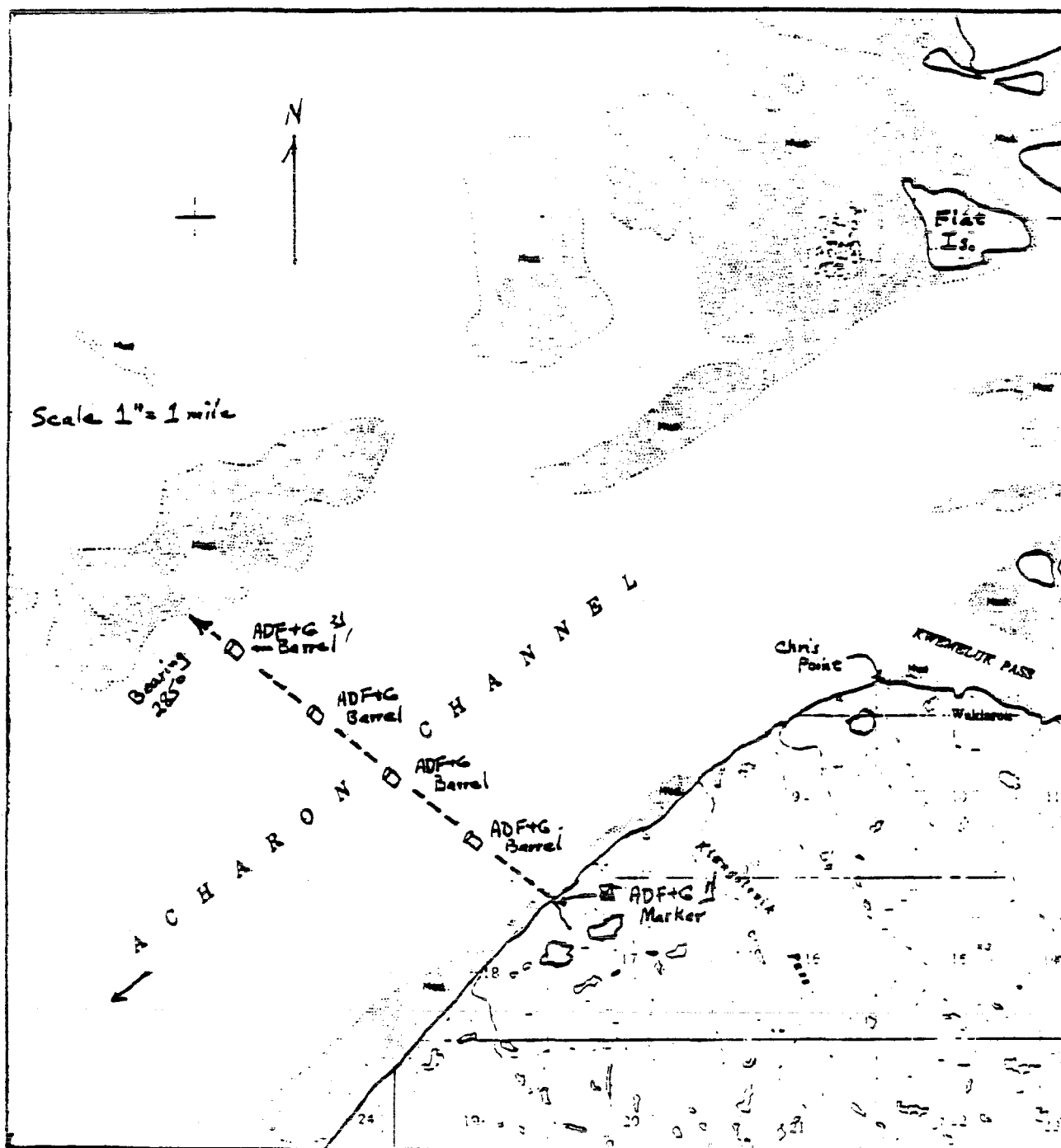


Figure 16. Closed waters Acharon Channel, south mouth Yukon River. (5AAC 05.350. CLOSED WATERS. (1) Acharon Channel of the south mouth area of the Yukon River west of a 2-1/2 nautical mile long line bearing 285° from an ADF&G regulatory marker located below Chris Point to the opposite side of the channel; the line may be marked by a series of yellow and green barrels placed by the Department between shore markers).

1/ ADF&G Regulatory Marker Sign, erected 5' height with driftwood logs, located on river bank at terminus of rivulet between two lakes approximately 2-1/2 miles below Chris Point.

2/ ADF&G yellow and green 55 gal. barrels anchored offshore.

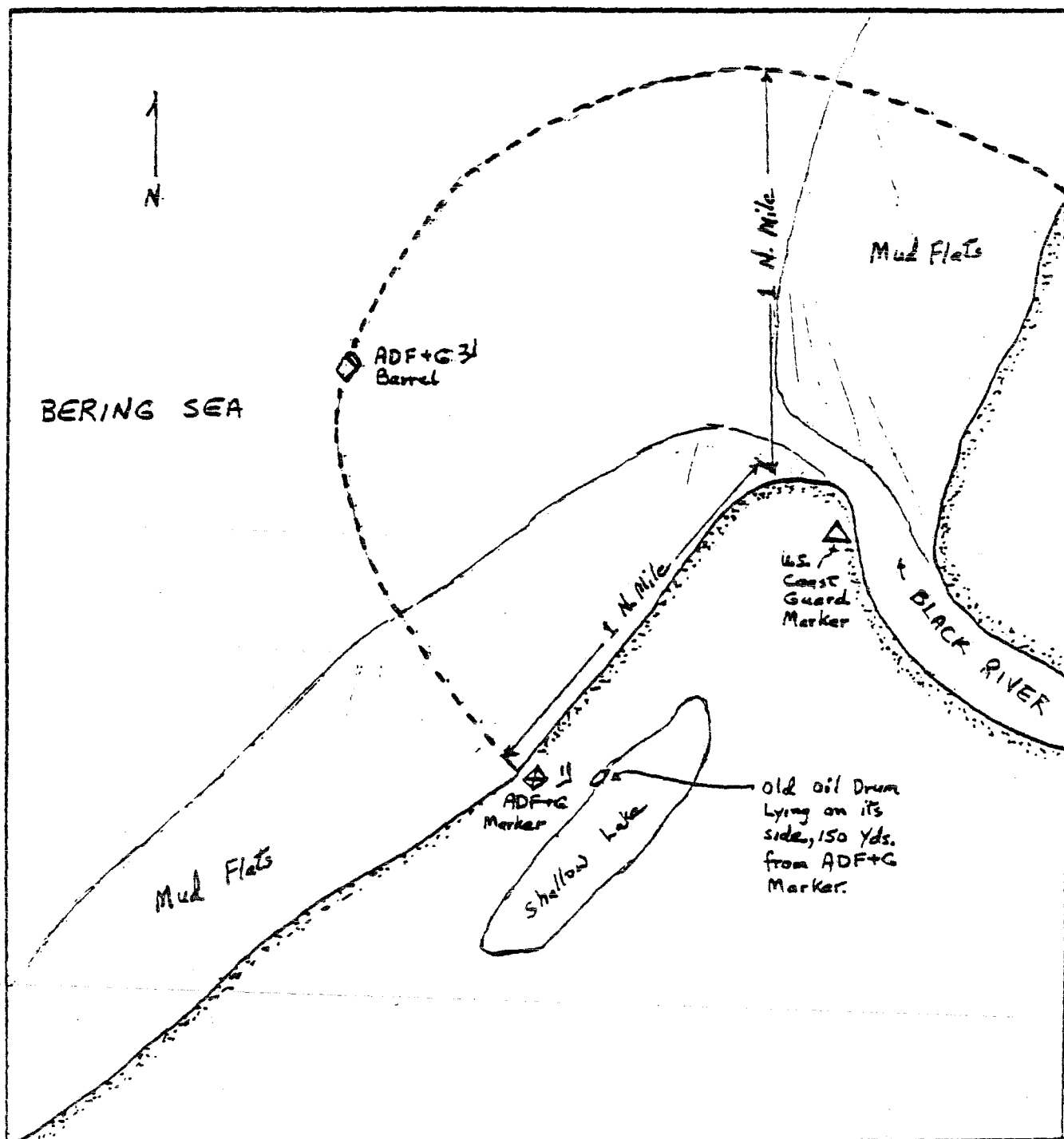


Figure 17. Closed waters of Black River mouth. (5AAC 05.350. CLOSED WATERS. (3) waters west of a one nautical mile radius from the mouth of Black River).

- 1/ ADF&G Regulatory Marker Sign erected 6' height with driftwood logs.
- 2/ ADF&G yellow and green 55 gal. barrel anchored 1 nautical mile offshore.

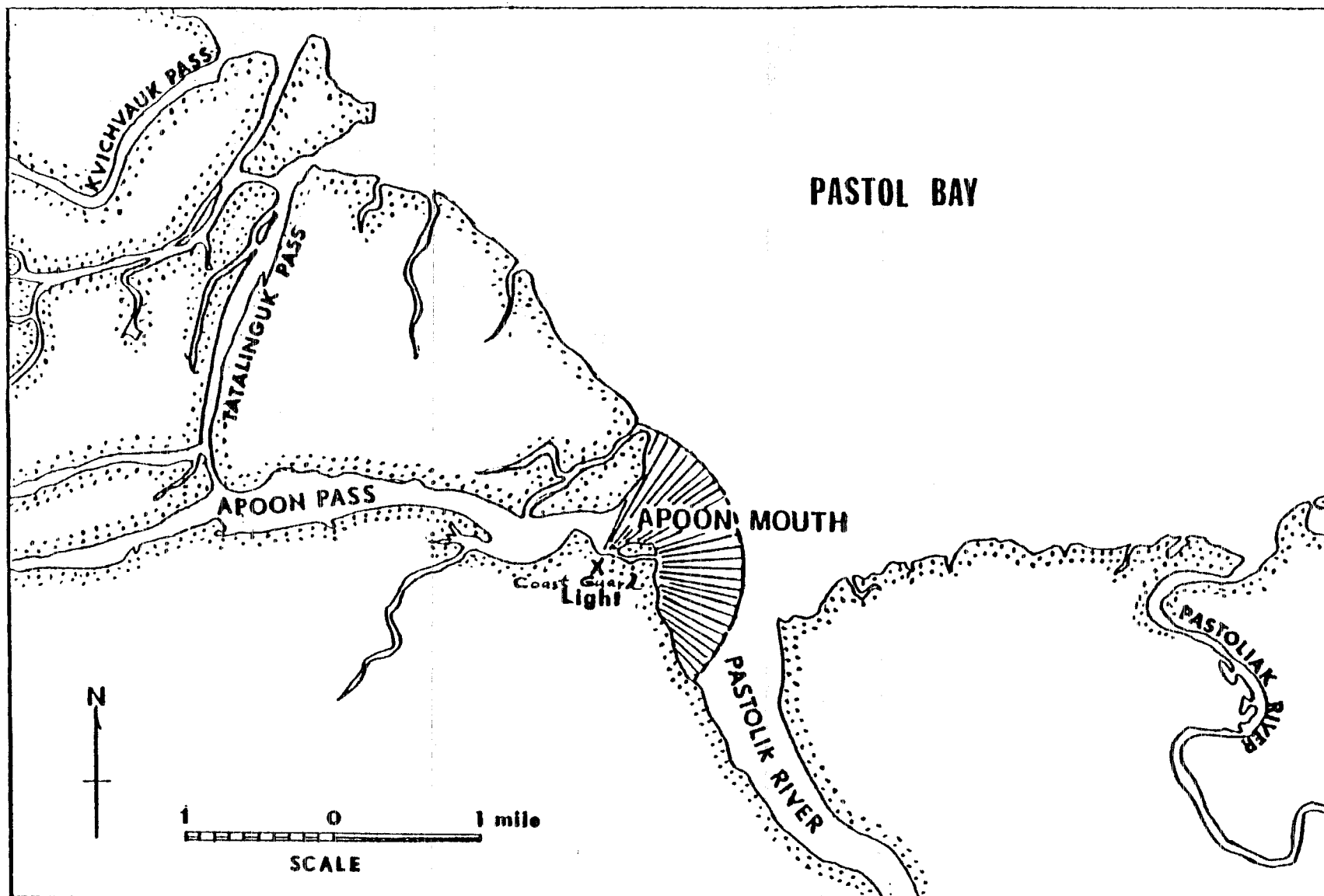


Figure 18. Closed waters of Apoon Mouth, Yukon River (5 AAC 05.350. CLOSED WATERS. (9) Waters east of a one nautical mile radius from a U.S. Coast Guard light at the mouth of Apoon Pass).

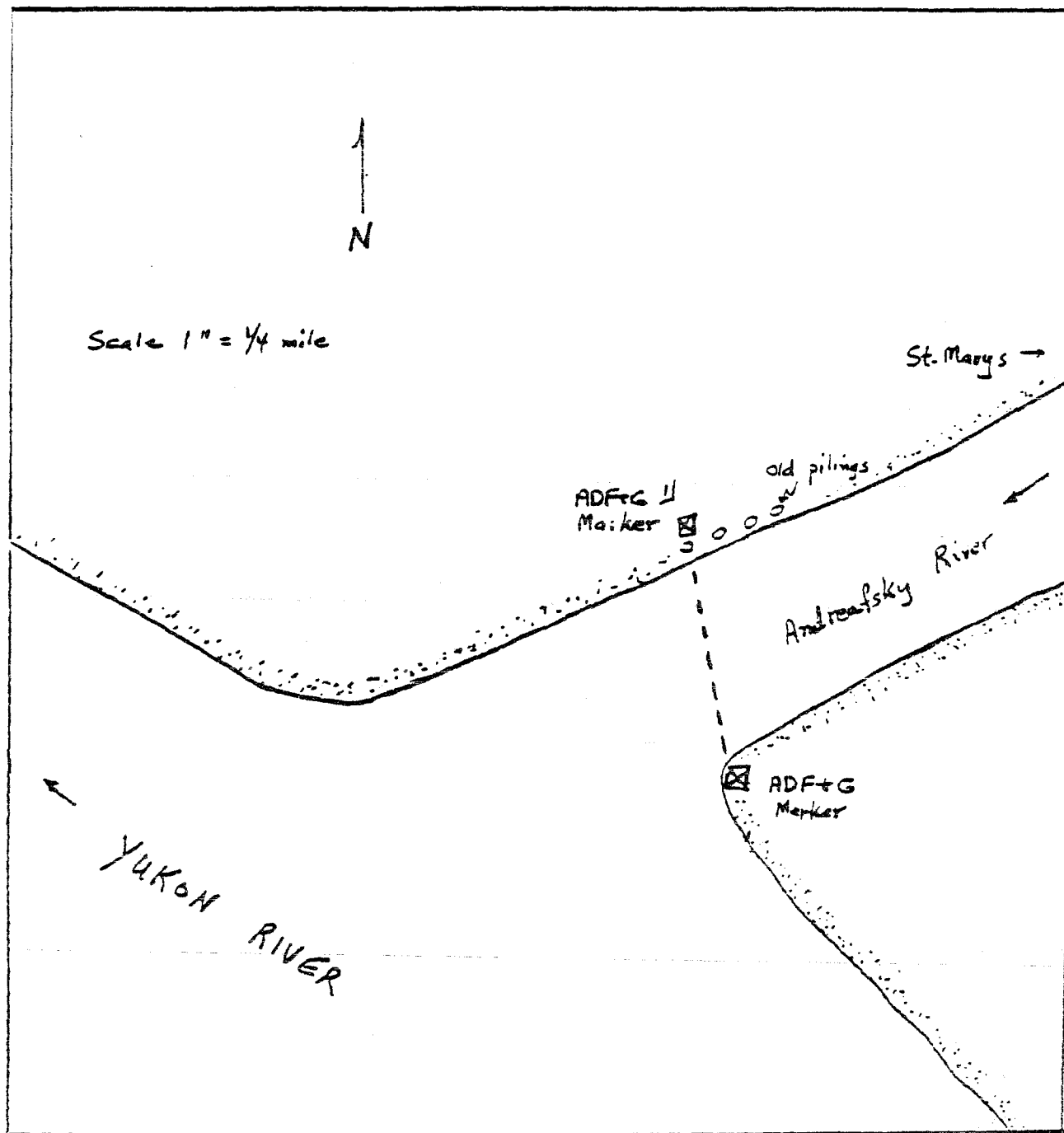


Figure 19. Closed waters of Andreafsky River mouth. (SAAC 05.350. CLOSED WATERS. (4) waters of the Andreafsky River upstream of a line from Department regulatory markers placed on each side of the river at its mouth).

- 1/ North bank ADF&G regulatory marker sign attached to 4th wooden piling stump downstream.

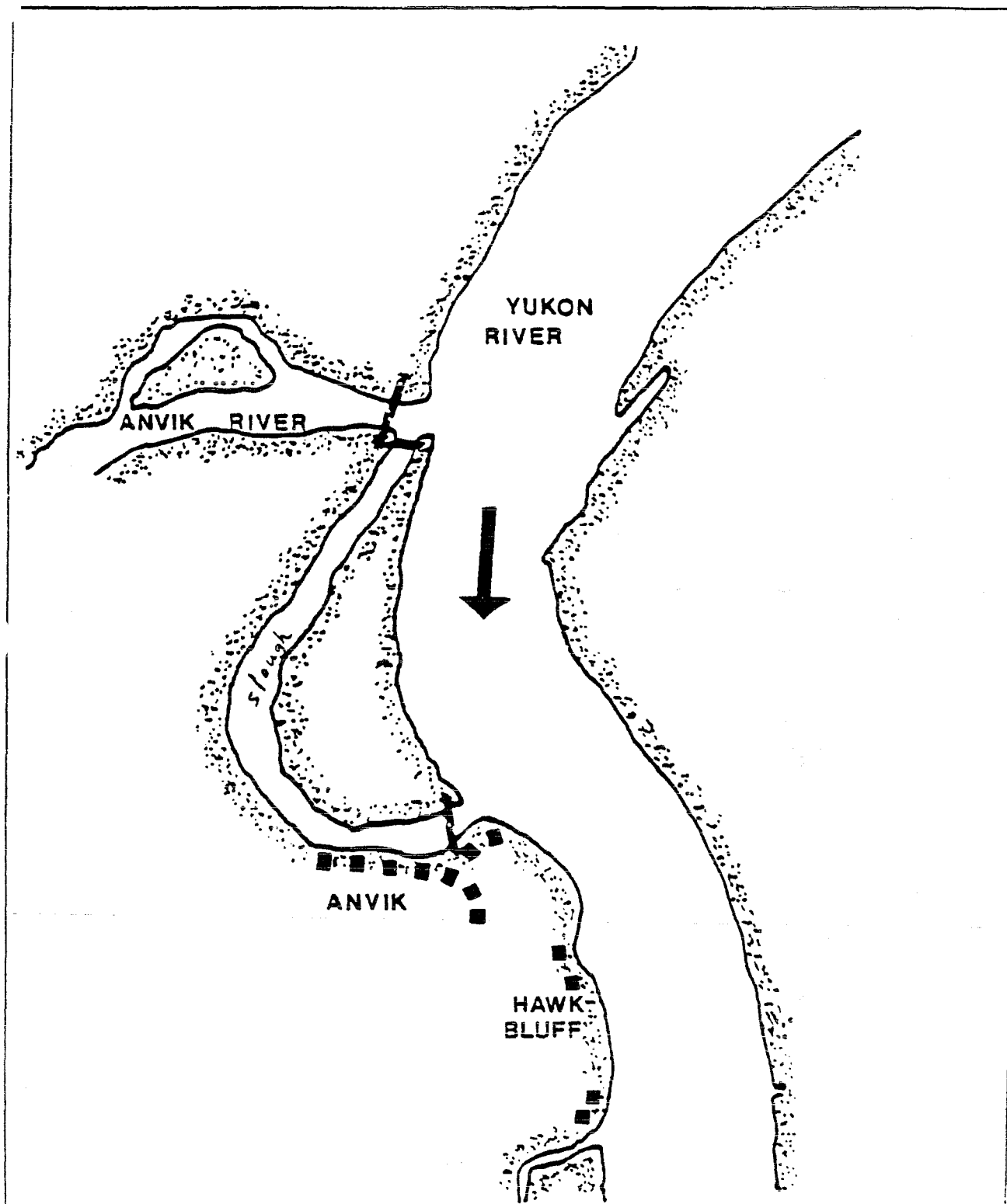


Figure 20. Closed waters of Anvik River mouth. (5AAC 05.350. (CLOSED WATERS (8) waters of the Anvik River upstream of a line between department regulatory markers placed on each side of the river at its mouth). Markers (6) placed north and south banks of the Anvik River mouth and at upstream and downstream mouths of slough (Old Anvik River Channel).

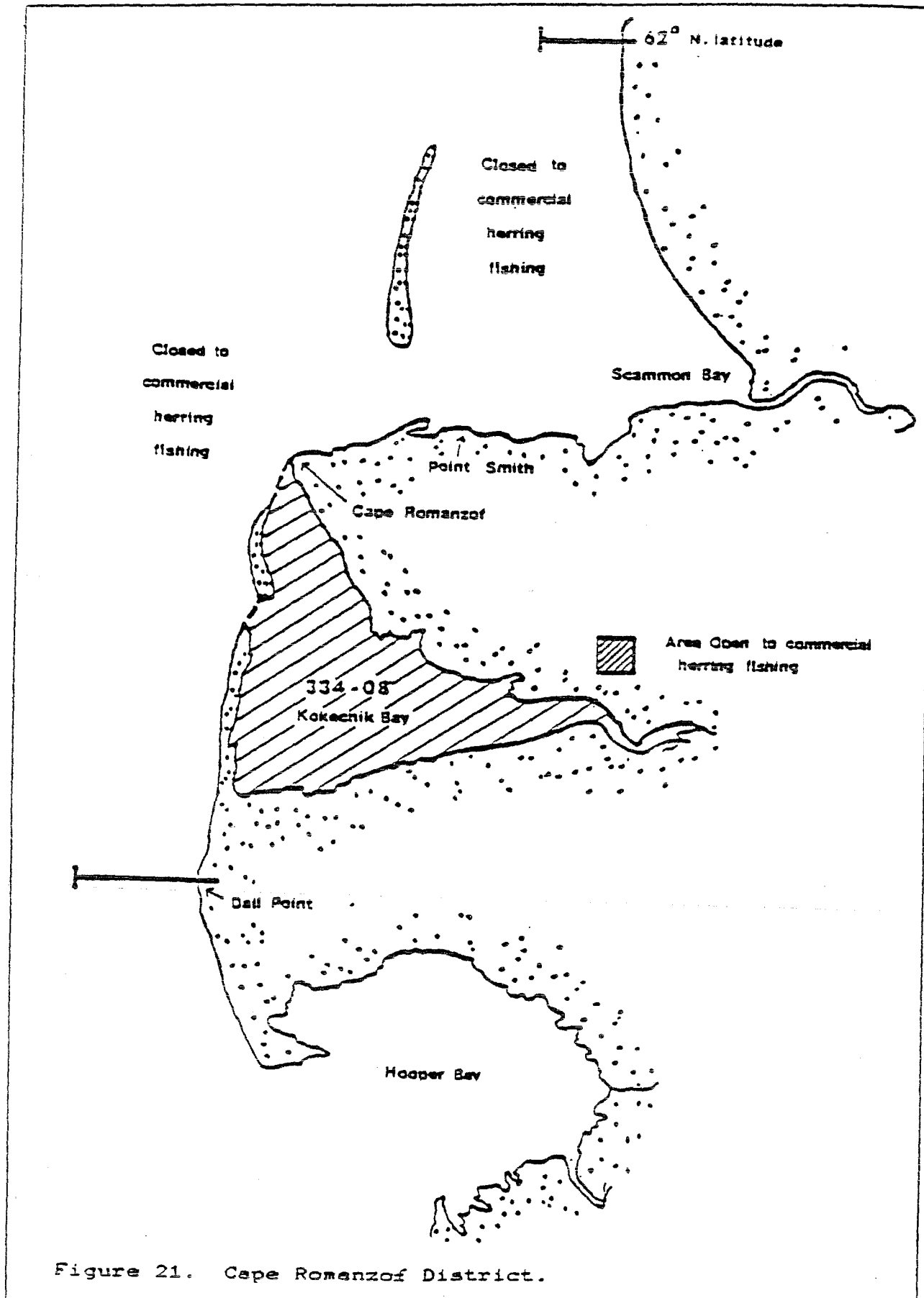


Figure 21. Cape Romanzof District.

Table 1. List of indigenous fishes found in the Yukon Area.^a

Species Code	Scientific Name	Common Name
601	<u>Lampetra japonica</u>	Arctic lamprey
570	<u>Stenodus leucichthys</u>	sheefish
588	<u>Coregonus nasus</u>	broad whitefish
589	<u>Coregonus pidschian</u>	humpback whitefish
583	<u>Coregonus sardinella</u>	least cisco
585	<u>Coregonus laurettae</u>	Bering cisco
586	<u>Prosopium cylindraceum</u>	round whitefish
587	<u>Prosopium coulteri</u>	pygmy whitefish
610	<u>Thymallus arcticus</u>	Arctic grayling
550	<u>Salvelinus namaycush</u>	lake trout
520	<u>Salvelinus alpinus</u>	Arctic char
530	<u>Salvelinus malma</u>	Dolly Varden
410	<u>Oncorhynchus tshawytscha</u>	chinook salmon
420	<u>Oncorhynchus nerka</u>	sockeye salmon
430	<u>Oncorhynchus kisutch</u>	coho salmon
440	<u>Oncorhynchus gorbuscha</u>	pink salmon
450	<u>Oncorhynchus keta</u>	chum salmon
513	<u>Osmerus mordax dentex</u>	rainbow smelt
514	<u>Hypomesus olidus</u>	pond smelt
500	<u>Esox lucius</u>	Northern pike
630	<u>Dallia pectoralis</u>	blackfish
650	<u>Couesius plumbeus</u>	lake chub
640	<u>Catostomus catostomus</u>	longnose sucker
670	<u>Percopsis omiscomaycus</u>	trout-perch
590	<u>Lota lota</u>	burbot, lush
661	<u>Pungitius pungitius</u>	nine-spine stickleback
162	<u>Cottus cognatus</u>	slimy sculpin
ESTUARINE		
113	<u>Eleginus gracilis</u>	saffron cod
129	<u>Platichthys stellatus</u>	starry flounder
	<u>Liopsetta glacialis</u>	Arctic flounder
230	<u>Clupea pallasii</u>	Pacific herring
516	<u>Mallotus villosus</u>	capelin

a Includes fishes found in the Yukon River drainage in Canada.

Table 2. Yukon River drainage mileages.

<u>Location</u>	<u>Mileage from Mouth</u>	<u>Location</u>	<u>Mileage from Mouth</u>
NORTH MOUTH (APOON PASS)		(District 2/3 Boundary)	
Kotlik	6	Kakamut	193
Hamilton	26	Russian Mission	213
		Dogfish Village	227
MIDDLE MOUTH (KWIKPAK, KAWANAK PASS)		Paimuit	251
		Mouth, Innoko River	274
		(South Slough)	
Choolunawick	16	Shageluk	328
Akers Camp	26	Holikachuk	383
New Hamilton	34	Holy Cross	279
		Mouth, Koserefski River	286
		Old Paradise Village	301
SOUTH MOUTH (KWIKLUAK PASS)		(District 3/4 Boundary)	
Mouth, Black River	-18	Mouth, Bonasila River	306
Flat Island	0	Anvik	317
Sheldon Point	5	Mouth, Anvik River	318
in Can Point	8	Grayling	36
Alakanuk	17	Mouth, Thompson Creek	349
Emmonak-Kwiguk (Kwiguk Pass)	24	Blackburn	370
Sunshine Bay	24	Eagle Slide	402
Aproka Pass (upstream mouth)	35	Mouth, Rodo River	447
Kwikpak Pass (upstream mouth)	44	Kaltag	450
Head of Passes	48	Mouth, Nulato River	483
Fish Village	52	Nulato	484
Mouth, Anuk River	63	Koyukuk	502
(District 1/2 Boundary)		Mouth, Koyukuk River	508
Patsys Cabin	71	Mouth, Gisasa River	564
Mountain Village	87	Huslia	711
Old Andreafsky	97	Mouth, Dakli River	755
Pitkas Point	103	Mouth, Hogatza River	780
Mouth, Andreafsky River	104	Hughes	881
St. Marys	107	Mouth, Kanuti River	935
Pilot Station	122	Alatna (Mouth, Alatna R.)	956
Mouth, Atcheulinguk		Allakaket	956
(Chulinak) River	126	Mouth, South Fork	986
Pilot Village	138	Mouth, John River	1,117
Marshall (Fortuna Ledge)	161	Bettles	1,121
Upstream Mouth Owl Slough	163	Middle Fork	1,141
Ingrihak	170	Cold Foot	1,174
Ohogamuit	185	Wiseman	1,186

<u>Location</u>	<u>Mileage from Mouth</u>	<u>Location</u>	<u>Mileage from Mouth</u>
Galena	530	Outlet, Healy Lake	1,071
Whiskey Creek	555	Outlet, Lake George	1,086
Mouth, Yuki River	562	Tanacross	1,128
Ruby	581	Outlet, Tetlin Lake	1,188
Mouth, Melozitna River	583	Mouth, Nabesna River	1,210
Horner Hot Springs	605	Northway Junction	1,214
Kokrines	608	Mouth, Chisana River	1,215
Mouth, Nowitna River	612	Mouth, Sheep Creek	1,297
Birches	647	Rampart Rapids	731
Kallands-Mouth of Illinois Creek		Rampart	763
(District 4/5 Boundary)	664	Mouth, Hess Creek	789
Mouth, Tozitna River	681	Mouth, Ray River	817
Tanana Village	695	Highway Bridge -	820
Mouth, Tanana River	695	Pipeline Crossing	
(District 5/6 Boundary)		Mouth, Dall River	841
Manley Hot Springs	765	Stevens Village	847
Mouth, Kantishna River	793	Mouth, Hodzana River	897
Mouth, Toklat River	838	Beaver	932
Mouth, Sushana R.	850	Mouth Hadweenzic River	952
Mouth, Bearpaw River	887	Mouth, Chandalar River	
Outlet, L. Minchumina	959	(Venetie Landing)	982
Minto	835	Venetie	1,025
Nenana	860	Fort Yukon	1,002
Mouth, Nenana River	860	Mouth, Porcupine River	1,002
Mouth, Wood River	894	Mouth, Black River	1,026
Rosie Creek Bluffs	912	Chalkyitsik	1,084
Mouth, Chena R. (Fairbanks)	920	Mouth, Salmon Fork R.	1,142
Mouth, Salcha River	965	Mouth, Sheenjek River	1,054
Benchmark #735 Slough	991	Mouth, Coleen River	1,157
Mouth, Little Delta R.	1,000	Mouth, Salmon Trout R.	1,193
Mouth, Delta Creek	1,014	U.S. - Canadian Border	1,219
Mouth, Clear Creek	1,015	Old Crow	1,259
(Richardson-Clearwater)		Fishing Branch R.	1,600
Mouth, Shaw Creek	1,021	spawning area	
Mouth, Delta River	1,031	Circle	1,061
(Big Delta)		Woodchopper	1,110
Delta Junction	1,041	Mouth, Charley River	1,124
Mouth, Goodpaster River	1,049	Mouth, Kandik River	1,135
Bluff Cabin Slough	1,050	Mouth, Nation River	1,166
Outlet, Clearwater Lake	1,052	Mouth, Tatonduk River	1,186
Outlet, Clearwater Crk	1,053	Mouth, Seventymile River	1,194

Table 3. (p. 2 of 4)

Commercial operation (Processing location/ buying station)	Product	District
Amukon Salt General Delivery Scammon Bay, AK 99662 (Black River)	Hard Salt Chinook Chum Coho	1
Bering Sea Fisheries, Inc. 4413 83rd Ave. SE Everett, WA 98205 (Lamont Slough)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
Anpac, Inc. P.O. Box 92520 Anchorage, AK 99509 (Emmonak and Mt. Village)	Fresh Salmon Chinook Chum Coho Salmon Roe	1 and 2
Schenk Seafood Sales, Inc. P.O. Box 984 Bellingham, WA 98227 (Lamont Slough)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
Boreal Fisheries P.O. Box 561 Graham, WA 98338 (Old Andreafsky)	Fresh Salmon Chinook Chum Coho Salmon Roe	1 and 2
Nakamura & Associates, Inc. 811 First Ave., Suite 400 Colman Building Seattle, WA 98104 (Marshall)	Fresh Salmon Chinook Chum Coho Salmon Roe	2 and 3
Y-K Fisheries P.O. Box 213 McGrath, AK 99627 (St. Marys)	Fresh Salmon Chinook Chum Coho Salmon Roe	2
Pacific Caviar 117 Telegraph Rd. Suite 316 Bellingham, WA 98226 (Aniak, Anvik, Grayling)	Fresh Salmon Chinook Chum Salmon Roe	3 and 4

-Continued-

Table 3. (p. 3 of 4)

Commercial operation (Processing location/ buying station)	Product	District
Azuma Corporation Ltd. 520 W. 58th Ave. Anchorage, AK 99518 (Aniak P.O. Box 19)	Smoked Salmon Chinook Chum Coho Salmon Roe	4
Dainty Island Box 49 Galena, AK 99741 (Galena)	Smoked Salmon Chinook Chum Salmon Roe	4
Walton Seafoods (TOWA) P.O. Box 258 McGrath, AK 99827 (Anvik)	Salmon Roe	4
Great Northern Seafoods 2604 Fairbanks St. Suite B Anchorage, AK 99503 (Galena)	Salmon Roe	4
Kallands Fisheries 405 Slater St. #8 Fairbanks, AK 99701	Fresh/Frozen Salmon Chinook Chum Coho	4
Whitney Foods P.O. Box 190429 Anchorage, AK 99503 (Nulato, Kaltag)	Frozen Salmon Chinook Chum Coho Salmon Roe	4
Towa Americana, Inc. 424 East Manor Ave. Anchorage, AK 99501 (Galena) Towa Americana-Madros (Nulato, Koyukuk)	Frozen Salmon Chinook Chum Coho Salmon Roe	4
Interior Alaska Fish Processing 878 Lynnwood Way North Pole, AK 99705 (North Pole)	Frozen Salmon Smoked Salmon Chinook Chum Coho Salmon Roe	4, 5, and 6

-Continued-

Table 3. (p. 4 of 4)

Commercial operation (Processing location/ buying station)	Product	District
Yutana Fisheries P.O. Box 82556 College, AK 99708 (Manley)	Frozen Salmon Chinook Chum Coho Salmon Roe	5 and 6
Circle Fish Co. P.O. Box 14 Circle, AK 99733 (Circle)	Frozen Salmon Chinook Chum Salmon Roe	5
Denny Mac Enterprizes, Inc. P.O. Box 289 Nenana, AK 99760 (Nenana)	Frozen Salmon Chum Coho Salmon Roe	4 and 6
Ludecker 2875 Ludecker Rd. Fairbanks, AK 99701	Fresh/Frozen Salmon Chinook Chum Coho	6
Stevens Fisheries P.O. Box 38 Nenana, AK 99760 (Nenana)	Frozen Salmon Chum Coho	6

Table 4. Yukon Area commercial salmon and salmon roe sales by statistical area, 1989. a,b

Statistical Area	Summer Season c			Fall Season d				Total				
	Chinook	Chum	Chum Roe e	Chinook	Chum	Chum Roe e	Coho	Chinook	Chum	Chum Roe e	Coho	Pink f
334-11	2,212	29,129	0	1	0	0	0	2,213	29,129	0	0	0
12	5,687	89,794	0	16	2,929	0	1,822	5,703	92,723	0	1,822	8
13	4,793	40,036	0	1	1,420	0	306	4,794	41,456	0	306	0
14	3,994	71,576	0	5	5,577	0	1,114	3,999	77,153	0	1,114	9
15	12,647	118,908	0	35	26,611	0	5,830	12,682	145,519	0	5,830	0
16	7,270	20,468	0	33	17,477	0	4,696	7,303	37,945	0	4,696	0
17	18,026	136,669	0	11	15,526	0	7,680	18,037	152,195	0	7,680	0
18	4,416	41,051	0	6	8,336	0	3,222	4,422	49,387	0	3,222	0
Subtotal District 1	59,045	547,631	0	108	77,876	0	24,670	59,153	625,507	0	24,672 k	17
334-21	5,248	46,224	0	9	12,005	0	6,195	5,257	58,229	0	6,195	0
22	12,355	140,571	0	25	34,268	0	18,427	12,380	174,839	0	18,427	0
23	4,641	48,986	0	6	15,001	0	3,668	4,647	63,987	0	3,668	0
24	4,406	54,542	0	5	19,029	0	4,262	4,411	73,571	0	4,262	0
25	6,527	53,639	0	3	17,603	0	5,965	6,530	71,242	0	5,965	0
Subtotal District 2	33,177	343,962	0	48	97,906	0	38,517	33,225	441,868	0	38,522 k	0
334-31	1,623	7,548	0	0	15,153	0	3,978	1,623	22,701	0	3,978	0
32	22	30	0	0	179	0	10	22	209	0	10	0
Subtotal District 3	1,645	7,578	0	0	15,332	0	3,988	1,645	22,910	0	3,988	0
TOTAL LOWER YUKON	93,867	899,171	0	156	191,114	0	67,175	94,023	1,090,285	0	67,182 k	17
334-41	59	14,397	270,039	0	0	0	0	59	14,397	270,039	0	0
42	694	2,940	9,915	2	9,819	2,023	0	696	12,759	11,938	0	0
43	2,035	1,217	3,351	0	1,957	1,384	3	2,035	3,174	4,735	3	0
Subtotal District 4	2,788	18,554	283,305	2	11,776	3,407	3	2,790	30,330	286,712	3	0
334-51	31	0	0	0	372	60	0	31	372	60	0	0
52	1,411	112	204	0	9,937	3,327	0	1,411	10,049	3,531	0	0
53	1,459	1	169	0	4,987	209	84	1,459	4,988	378	84	0
54	385	41	0	0	2,919	393	0	385	2,960	393	0	0
Subtotal District 5	3,286	154	373	0	18,215	3,989	84	3,286	18,369	4,362	84	0
334-61	809	16,483	61	0	14,870	173	2,818	809	31,353	234	2,818	0
62	614	18,960	4,277	0	25,650	7,050	10,181	614	44,610	11,327	10,181	0
63	318	6,672	533	0	8,570	130	3,080	318	15,242	663	3,085 k	0
Subtotal District 6	1,741 g	42,115 h	4,871	0	49,090 i	7,353	16,079 j	1,741	91,205	12,224	16,084 k	0
TOTAL UPPER YUKON	7,815 g	60,823 h	288,549	2	79,081 i	14,749	16,166 j	7,817	139,904	303,298	16,171 k	0
GRAND TOTAL YUKON AREA	101,682 g	959,994 h	288,549	158	270,195 i	14,749	83,341 j	101,840	1,230,189	303,298	83,353 k	17

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.

b Refer to Table 13 for estimates of total commercial related harvest.

c Summer Season

d Fall Season

District 1 6/13-7/14 District 4 6/21-8/01

District 2 6/15-7/13 District 5 6/23-7/13

District 3 6/21-7/10 District 6 7/07-8/09

District 1 7/27-8/25

District 2 7/30-8/27

District 3 7/30-8/27

District 4 8/06-9/08

District 5 8/12-9/10

District 6 9/01-9/24

e May include small amounts of chinook and coho salmon roe.

f Pink salmon catches occurred between 7/06-8/11.

g Does not include 440 chinook salmon sold as part of a test fishing project in District 6.

h Does not include 6,267 summer chum salmon sold as part of a test fishing project in District 6.

i Does not include 16,984 fall chum salmon sold as part of a test fishing project in District 6.

j Does not include 2,140 coho salmon sold as part of a test fishing project in District 6.

k Totals include summer season coho salmon catches.

Table 5. Yukon Area Commercial Fisheries Entry Commission
salmon gear permits issued by residence, 1989. a,b

District	Residence	Gillnet Permits	Fishwheel Permits
1, 2 and 3	Emmonak	101	
	Mountain Village	94	
	Aiakanuk	81	
	Kotlik	72	
	St. Marys	69	
	Pilot Station	48	
	Scammon Bay	38	
	Marshall	49	
	Sheldon Point	22	
	Anchorage	20	
	Russian Mission	16	
	Bethel	15	
	Holy Cross	12	
	Fairbanks	10	
	Stebbins	10	
	Unalakleet	8	
	Wasilla	6	
	Shaktoolik	4	
	Chevak	2	
	Eagle River	2	
	Kenai	2	
	Pitkas Point	2	
	Sitka	1	
	Aniak	1	
	Big Lake	1	
	Cooper Landing	1	
	Deering	1	
	Eek	1	
	Elim	1	
	Ester	1	
	Fort Yukon	1	
	Hoonah	1	
	Hooper Bay	1	
	Iliamna	1	
	Kasigluk	1	
	Kodiak	1	
	Koliganek	1	
	Manley Hot Springs	1	
	Napaskiak	1	
	Nome	1	
	Palmer	1	
	Red Devil	1	
	Salcha	1	
	Sand Point	1	
	Seward	1	
	St. Michael	1	
	Takotna	1	
	Talkeetna	1	
	Cameron Mills, NY	1	
	Everett, WA	1	
	Gig Harbor, WA	1	
	Onalaska, WA	1	
	Rock Hill, SC	1	
	Seattle, WA	1	
	Troy, MT	1	
Total Lower Yukon		716 a,b	

(Continued)

Table 5. (p. 2 of 2).

4, 5, and 6	Anchor Pt.	0	2
	Anchorage	5	0
	Aniak	1	0
	Anvik	2	7
	Barrow	0	1
	Cantwell	1	1
	Circle	1	1
	College	0	1
	Dillingham	0	1
	Fairbanks	22	19
	Ft. Yukon	0	1
	Galena	6	22
	Grayling	2	6
	Holy Cross	1	0
	Huslia	0	1
	Katag	4	13
	Kasilof	1	0
	Kodiak	1	0
	Koyukuk	0	3
	Manley	2	5
	McGrath	0	1
	Nenana	8	21
	North Pole	1	3
	Nulato	1	19
	Rampart	3	2
	Ruby	3	10
	Salcha	0	1
	Seldotna	1	0
	Stevens Village	1	3
	Tanana	5	16
	Willow	1	0
	Bemidji, MN	1	0
	Los Angeles, CA	1	0
Total Upper Yukon		75	160
Grand Total Yukon Area		791	160

- a Counts are for initial issues only and do not include transfers.
- b Counts include interim use permits.

Table 14. Yukon River drainage subsistence and personal use salmon harvest, 1989. a

Village	Survey Date	Fishing Households b	Dogs	Chinook	Summer Chum	Fall Chum	Coho	Set Nets	Drift Nets	Fish Wheels
Sheldon Pt.	8/31	21	23	165	4,314	586	487	12	2	0
Alakanuk	8/30	96	80	820	12,108	430	334	23	24	0
Emmonak c	8/28-29	86	48	1,598	22,985	840	1,259	9	17	0
Kotlik d	9/6-7	75	111	1,982	13,437	3,058	2,997	26	15	0
Personal Use	permits	14	-	323	431	20	67	2	12	0
Y-1 Subtotal		292	262	4,888	53,275	4,934	5,144	72	70	0
Mt. Village	9/9	120	75	2,001	15,869	4,641	2,385	2	34	0
Pitkas Pt.	9/10	14	46	592	4,176	275	601	0	5	0
St. Marys	9/11-12	45	113	1,592	8,948	1,695	370	2	20	0
Pilot Station	9/13	66	22	1,498	6,783	1,872	379	5	19	0
Marshall	9/14	41	157	1,464	3,927	1,532	1,304	2	22	0
Y-2 Subtotal		286	413	7,147	39,703	10,015	5,039	11	100	0
Russian Mission	9/15	35	57	2,367	2,229	308	20	7	7	0
Holy Cross	9/18-19	29	51	2,379	1,753	711	517	8	15	0
Y-3 Subtotal		64	108	4,746	3,982	1,019	537	15	22	0
Lower Yukon Total e		642	783	16,781	96,960	15,968	10,720	98	192	0
Anvik	9/16-17	16	75	418	410	168	40	5	0	3
Shageluk f	9/20	10	24	32	8,842	4	0	3	0	0
Grayling	9/21-22	29	73	1,082	14,570	830	969	9	1	3
Kaltag	10/10-11	27	123	1,306	632	1,654	792	2	11	9
Nulato	10/11-12	32	84	2,079	200	2,436	276	6	21	8
Koyukuk	10/13-18	16	57	1,003	381	2,460	110	7	2	1
Galena	10/17-21	54	137	1,374	6,216	6,436	415	19	3	6
Ruby	10/5-6	32	129	1,016	1,844	6,599	1,069	8	0	9
Y-4 Subtotal		216	702	8,310	33,095 g	20,587	3,671	59	38	39
Tanana	10/24-25	43	343	3,008	7,756	40,845	5,518	13	1	17
Rampart	10/27	15	18	3,177	28	2,472	87	8	0	3
Fbks. Pers-use h	permits	36	-	2,211	316	3,536	88	29	0	5
Stevens Village i	10/27	19	92	3,101	2,375	6,633	208	13	0	4
Beaver	10/26-27	19	53	1,694	124	7,242	774	8	0	2
Birch Creek	10/27	0	0	0	0	0	0	0	0	0
Ft. Yukon	11/1-3	67	297	4,898	1,760	27,790	406	25	0	17
Circle/Central j,k	10/30	19	60	1,785	361	4,478	1	11	0	6
Eagle l,k	11/9-10	38	128	2,385	547	11,557	0	17	0	2
Y-5 Subtotal		256	991	22,259	13,267	104,553	7,082	124	1	56
Main River Totals		1,114	2,476	47,350	143,322	141,108	21,473	281	231	95

-Continued-

Table 14. Yukon River drainage subsistence and personal use salmon harvest, 1989
(Continued). a

Village	Survey Date	Fishing Households b	Dogs	Chinook	Summer Chum	Fall Chum	Coho	Set Nets	Drift Nets	Fish Wheels
Manley k,m	11/9-10	21	250	992	2,457	21,087	5,310	14	0	7
Minto k	11/10-11	14	98	366	1,425	2,005	1,179	7	0	5
Nenana k,n	11/15	38	58	1,188	3,936	25,340	7,593	18	0	19
Kantishna R. k	Permits	6	-	0	50	5,864	1,801	2	0	3
Healy k	11/15	6	20	0	0	4,358	2,958	4	0	1
Fbks Pers-use o	Permits	127	-	500	1,320	1,997	809	117	0	8
Y-6 Subtotal		212	426	3,046	9,188	60,651	19,650	162	0	43
Huslia	10/16-17	19	179	177	10,005	1,728	150	17	0	2
Hughes	10/18-19	10	75	181	3,687	260	91	6	0	1
Allakaket/Alatna	10/30-11/1	29	124	438	2,915	1,969	118	21	0	0
Bettles	10/30	3	-	0	75	0	0	0	0	0
Koyukuk R. Subtotal		61	378	796	16,682	3,957	359	44	0	3
Venetie	11/6-7	26	127	88	30	7,977	2	12	0	0
Chalkyitsik	10/31-11/1	5	21	0	0	3,000	26	5	0	0
Subtotal Chandalar/Black River		31	148	88	30	10,977	28	17	0	0
Subtotal Upper Yukon (Alaska)		776	2,645	34,499	72,262	200,725	30,790	406	39	141
Yukon River Drainage (Alaska) Total		1,418	3,428	51,280	169,222	216,693	41,510	504	231	141
Old Crow p		-	-	525	-	2,909	-	-	-	-
Yukon River Mainstem Canada p		-	-	7,630	-	2,562	-	-	-	-
Yukon Territory p Totals		-	-	8,155	-	5,471	-	-	-	-
Grand Total Yukon River Drainage		1,418	3,428	59,435	169,222	222,164	41,510	504	231	141

- a Data collected by Commercial Fisheries Division. Catch data and number of fishing households are expanded. Number of dogs and gear data are actual reported numbers in surveyed households.
- b Used proportion of contacted households and returned permits that fished to estimate number of unknowns that fished.
- c Includes 744 chinook, 3,495 summer chum, 685 fall chum and 581 coho salmon from ADF&G test fish catches.
- d Includes 482 chinook, 1,153 summer chum, 199 fall chum and 337 coho salmon from ADF&G test fish catches.
- e Does not include Hooper Bay and Scammon Bay harvest of 16 chinook, 2,341 summer chum, 156 fall chum, and 213 coho salmon.
- f Harvest from mainstem Yukon and Innoko Rivers (11 chinook and 2,050 summer chum reported from Innoko R.).
- g Does not include 80,360 summer chums taken during commercial roe fishery reported as used for subsistence.
- h Data from fishermen that fished between Hess Creek and Dall River (haul road bridge area). A total of 45 personal use permits issued of which 32 fished. Also, includes 6 Dalton/Elliott Hwy subsistence permits (2 fished) with a catch of 200 chinook and 7 fall chum.
- i Includes data from 15 permits issued (10 returned) to fishermen that fished between Hess Cr. and Dall R.
- j Includes Circle and vicinity, and Central.
- k Summed catches from not usually fish households to expanded survey and permit data from usually fish households to estimate harvest.
- l Includes Eagle and vicinity, and Eagle Village; and 5 permits from Tok and Chicken (1 fished).
- m Includes 340 chinook, 2,750 fall chum, and 460 coho salmon from ADF&G test fish catches.
- n Includes 51 chinook, 115 summer chum, 123 fall chum and 124 coho salmon from ADF&G test fish catches.
- o Includes personal use permits from District 6 (179 issued, 114 fished) and 2 subsistence permits from Delta/Ak Hwy and upstream of Subdistrict 6-C (5 chinook and 39 fall chum).
- p Indian Food Fish, Domestic, and Sport catch data from Department of Fisheries & Oceans, Whithorse, Yukon Territory.

Table 15. Subsistence and personal use salmon catches taken under authority of a permit, Yukon River area, 1989.

Permit Type and Location	Number Issued	Number Returned	Percent Returned	Reported Harvest				Expanded Harvest a			
				Chinook	StChum	FChum	Coho	Chinook	StChum	FChum	Coho
Personal Use, District 1	26	23	88%	286	381	18	59	323	431	20	67
Personal Use, District 5 near Haul Road Bridge	45	42	93%	1,877	295	3,294	82	2,011	316	3,529	88
Personal Use, District 6 Subdistrict 6-C	177	160	90%	397	991	1,770	731	439	1,096	1,958	809
Subdistrict 6-A & 6-B	2	2	100%	56	224	0	0	56	224	0	0
Delta River Carcasses b	12 b	12 b	100%	0	0	1,785 b	0	0	0	1,785 b	0
Personal Use Total	250	227	91%	2,616	1,891	5,082	872	2,830	2,067	5,508	963
Subsistence, District 5 near Haul Road Bridge											
Stevens Village c	15	10	67%	798	355	2,150	144				
Dalton/Elliott Hwy's d	6	6	100%	200	0	7	0				
Nenana c	2	2	100%	216	71	0	0				
Manley c	1	1	100%	223	148	0	165				
Ft Yukon c	1	0	0%								
Rampart c	1	1	100%	46	0	0	0				
Subsistence, District 5 near Circle & Eagle	26	20	77%	1,483	574	2,157	309	1,483	574	2,157	309
Eagle c	37	35	95%	843	6	5,489	0				
Circle c	12	11	92%	323	62	1,251	1				
Central c	5	5	100%	14	0	734	0				
Chicken e	2	2	100%	0	0	0	0				
Tok e	3	3	100%	0	0	16	0				
Subsistence, District 6 Tanana River	59	56	95%	1,180	68	7,490	1	1,180	68	7,490	1
Nenana c	39	34	87%	392	248	14,703	6,056				
Manley c	23	22	96%	311	1,918	14,435	3,931				
Minto c	17	13	76%	12	0	20	0				
Kantishna River c	5	5	100%	0	0	9,836	1,202				
Healy c	5	5	100%	0	0	1,905	1,972				
Delta/AK Hwy f	1	1	100%	0	0	39	0				
Upstream of Subdistrict 6-C f	1	1	100%	5	0	0	0				
Subsistence Total	176	157	89%	3,383	2,808	50,585	13,471	3,383	2,808	50,585	13,471
Grand Total	426	384	90%	5,999	4,699	55,667	14,343	6,213	4,875	56,093	14,434

a Calculated by multiplying the average harvest of returned permits times the number of permits issued.

b Delta River carcass data is not included in personal use and grand totals because live fish are not harvested.

c Permit data was combined with survey data to estimate harvests in Table 14.

d Subsistence permit data was combined with District 5 personal use data in Table 14.

e Chicken and Tok were combined with Eagle in Table 14.

f Subsistence permit data was combined with District 6 personal use data in Table 14.

Table 16. Yukon River drainage total utilization of salmon by district and country, 1989. a

District	Fishery	Chinook	Summer Chum	Fall Chum	Coho
1	Commercial	59,153	547,631	77,876	24,672
	Subsistence	4,565	52,844	4,914	5,077
	Personal Use	323	431	20	67
	Total	64,041	600,906	82,810	29,816
2	Commercial	33,225	343,962	97,906	38,522
	Subsistence	7,147	39,703	10,015	5,039
	Total	40,372	383,665	107,921	43,561
3	Commercial	1,645	7,578	15,332	3,988
	Subsistence	4,746	3,982	1,019	537
	Total	6,391	11,560	16,351	4,525
Total Lower Yukon	Commercial	94,023	899,171	191,114	67,182
	Subsistence	16,458	96,529	15,948	10,653
	Personal Use	323	431	20	67
	Total	110,804	996,131	207,082	77,902
4	Commercial	2,790	429,884 b	11,776 c	3
	Subsistence d	9,106	130,137 e	24,544	4,030
	Total	11,896	560,021	36,320	4,033
5	Commercial	3,286	154 c	18,215 c	84
	Subsistence f	20,336	12,981	112,001	7,022
	Personal Use	2,011	316	3,529	88
	Total	25,633	13,451	133,745	7,194
6	Commercial a	2,181	48,382 c	66,074 c	18,224
	Subsistence	2,551	7,868	58,693	18,841
	Personal Use	495	1,320	1,958	809
	Total	5,227	57,570	126,725	37,874
Total Upper Yukon	Commercial	8,257	478,420	96,065	18,311
	Subsistence	31,993	150,986	195,238	29,893
	Personal Use	2,506	1,636	5,487	897
	Total	42,756	631,042	296,790	49,101
Total Yukon Area (Alaska)	Commercial	102,280	1,377,591	287,179	85,493
	Subsistence	48,451	247,515	211,186	40,546
	Personal Use	2,829	2,067	5,507	964
	Total	153,560	1,627,173	503,872	127,003
Total Canada g	Commercial	9,789	0	17,549	0
	Subsistence h	8,155	0	5,471	0
	Total	17,944	0	23,020	0
Grand Total	Commercial	112,069	1,377,591	304,728	85,493
	Subsistence	56,606	247,515	216,657	40,546
	Personal Use	2,829	2,067	5,507	964
	Total	171,504	1,627,173	526,892	127,003

a ADF&G test fishery sales included in commercial harvest.

b Total estimated commercial related harvest was 510,244 summer chums (Table 13), however, 80,360 fish reported as used for subsistence purposes are not included.

c Does not include harvest of females for commercial roe sales (Table 13), since this harvest is believed to be reported in the subsistence harvest.

d Includes Innoko and Koyukuk River drainages.

e Includes 80,360 fish from the commercial related harvest which were reported as used for subsistence purposes.

f Includes Chandalar and Black River drainages.

g Data from Department of Fisheries and Oceans, Whitehorse, YT.

h Combined Indian Food and Domestic Fisheries.

Table 17. Salmon spawning escapement index counts and population estimates in the Yukon River drainage, 1989. a

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Andreafsky River						
East Fork (Aerial)	7/3,7/27	Early,Fair	1,399	21,460	--	--
West Fork (Aerial)	7/27	Fair,Fair	1,089	--	--	--
	Subtotal		2,488	21,460	--	--
Yukon River						
Pilot Station (Main River Sonar) b	6/8-9/11		79,362	1,622,331	684,840	174,631
Anvik River						
Aerial Counts						
Mainstem River	7/24	Poor	268	--	--	--
Beaver Creek	7/24	Poor	131	--	--	--
Canyon Creek	7/24	Poor	0	--	--	--
Otter Creek	7/24	Poor	35	--	--	--
Swift River	7/24	Poor	2	--	--	--
Yellow River	7/24	Poor	6	--	--	--
Sonar Count d	6/19-7/26		--	636,906	--	--
	Subtotal		442	636,906	--	--
Koyukuk River Drainage						
South Fork Koyukuk River (BLM)	7/25-8/8	Poor	128	59	--	--
South Fork Koyukuk River (ADF&G)	9/17	Poor	--	--	241	--
Jim River (BLM)	8/8	Poor	29	403	--	--
Jim River (ADF&G)	9/17	Poor	--	--	1	--
	Total Koyukuk River		157	462	242	--
Lower Tanana River Drainage						
Kantishna River Drainage						
Toklat River						
Barton Creek	8/3,10/12	Poor,Poor	137	--	27	12
Floodplain vic Rdhse f	10/21-26	Good	--	--	24,035	4
Geiger Creek g	10/21-26	Good	--	--	2,430	155
Sushana River g	10/21-26	Good	--	--	2,982	9
Population Estimate for upper Toklat area h			--	--	(30,447)	--
	Subtotal		137	--	29,474	180

-Continued-

Table 17. (p 2 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Clear Creek	8/3	Poor	15	--	--	--
Bear Paw River	8/3	Poor	9	--	--	--
Moose Creek	8/3	Poor	5	--	--	--
Subtotal			14	--	--	--
Nenana River Drainage						
Seventeen Mile Slough	9/7,10/13	Fair,Poor	--	--	8	824
Julius Creek						
Wood Creek Weir Counts i	9/19-10/31		--	--	1,091	412
Teklanika River	10/13	Poor	--	--	--	251
Total Nenana River			0	--	1,099	1,487
Chatanika River	7/22	Fair	72	35	--	--
Chena River (Aerial)	7/30	Fair-Good	1,280	714	--	--
Population Estimate j			(2,730)	--	--	--
Subtotal			1,280	714	--	--
Salcha River (Aerial)	7/30	Good-Poor	2,333	1,574	--	--
Population Estimate j			(3,572)			
Aerial Radio Tracking	10/10				8 u	
Subtotal			2,333	1,574	8 u	--
Total Lower Tanana River			3,851	2,323	30,581	1,667

-Continued-

Table 17. (p 3 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Upper Tanana River Drainage						
Slough vic Little Salcha River	11/2	Fair-Poor	--	--	37	--
Vicinity Benchmark 735 Slough	11/2	Poor	--	--	118	--
Slough vic of Little Delta R mo	11/2	Fair-Poor	--	--	680	--
Open water area vic Canyon Cr Camp	11/2		--	--	9	--
Richardson Clearwater River	11/2	Fair-Poor	--	--	201	483
Mainstem Tanana sloughs between Shaw Creek and Timber	11/2	Fair	--	--	1,301	2
South Bank Tanana	11/2	Poor	--	--	939	--
Blue Creek	11/2	Poor	--	--	40	25
Delta River						
Foot Survey (peak count)	10/31	Good	--	--	17,540	3
Population Estimate h			--	--	(20,000)c	--
Bluff Cabin Slough						
Aerial	11/2	Poor-Fair	--	--	5,386	--
Foot Survey	11/1	Poor	--	--	(2,706)	--
Bluff Cabin Spring	11/8	Poor	--	--	47	17
Clearwater Lake Outlet Slough	11/2	Poor	--	--	1,273	--
Clearwater Lake and Outlet n,k	10/28	Good	--	--	--	1,600
Delta Clearwater River n,k	10/27-28	Good-Fair	--	--	1,000	11,000
Onemile Slough	11/2	Fair	--	--	1,108	--
Slough adjacent Onemile Sl	11/2	Poor	--	--	50	--
Vicinity Pearse Slough	11/2	Fair	--	--	605	--
Slough vic Gerstle Ri mouth	11/2	Poor-Fair	--	--	102	--
Total Upper Tanana River			--	--	30,436	13,130
Total Tanana River			3,851	2,323	61,017	14,797
Chandalar River (Aerial)						
Sonar Estimate c,d,e	9/19	Good	--	--	(20,232)	--
	8/10-9/30		--	--	69,161 c	--
Porcupine River Drainage						
Sheenjek River (Aerial) v	8/22	Good-Poor	--	--	20,000 v	--
Sonar Estimate c,d	8/24-9/25		--	--	81,748 c	--
Subtotal			--	--	101,748	--
Fishing Branch River (Aerial) c,q						
Fishing Branch River (weir) c,q	8/30-10/16		--	--	(9,662)c	--
			--	--	43,834 c	--
Subtotal			--	--	43,834	--
Total Porcupine River			--	--	145,582	--
Total Alaskan Portion of Drainage			6,938	661,151	232,168 t	14,797

-Continued-

Table 17. (p 4 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Yukon Territory Streams						
White River						
Donjek River						
Kluane River q	10/19	Fair	--	--	3,050	--
Tincup Creek q	8/19	Good	88	--	--	--
Koidern River q	10/19	Good	--	--	40	--
Subtotal			88	--	3,090	--
Pelly River						
Ross River q	8/21	Fair	433	--	--	--
Ross River	8/17	Poor	(21)	--	--	--
Hoole River	8/17	Good	50	--	--	--
Subtotal			483	--	--	--
Tatchun Creek w	8/25-28		100	--	--	--
Nordenskjold River w	8/25-28		4	--	--	--
Little Salmon River						
ADF&G Aerial Survey	8/16	Good	(718)	--	--	--
DFO Aerial Survey	8/22	Good	862	--	--	--
Big Salmon River						
Big Salmon Lake to Scurvy Cr	8/15	Good	520	--	--	--
Scurvy Cr	8/15	Good	25	--	--	--
Scurvy Cr to Moose Cr	8/15	Good	408	--	--	--
Moose Cr to DFO weir	8/15	Good	458	--	--	--
DFO weir to Bat Cr	8/15	Good	78	--	--	--
Bat Cr to Souch Cr	8/15	Good	173	--	--	--
Downstream Souch Cr	8/15	Flyover	337	--	--	--
Subtotal			1,999	--	--	--
Teslin River Drainage						
Mainstem Teslin River q	11/1	Poor	--	--	210	--
Nisutlin River	8/15-16	Good-Fair	1,328	--	--	--
Wolf River	8/16	Good	324	--	--	--
Swift River w	8/30		19	--	--	--
Morley River w	8/29		79	--	--	--
Subtotal			1,750	--	210	--

-Continued-

Table 17. (p 5 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Takhini River q	8/28	Poor	72	--	--	--
Ibex River q	8/28	Good	0	--	--	--
Subtotal			72	--	--	--
Whitehorse Fishway Counts c,q			549 r	--	--	--
Mainstem Yukon River						
Tatchun Creek to Ft Selkirk q	10/18	Good	--	--	5,320	--
Spawning Population Estimates j,q			(25,417)c,s	--	(35,974)c,s	--
Subtotal			--	--	5,320	--
Total Yukon Territory			5,907	--	52,454 t	--
Yukon River Drainage Totals			12,845	661,151	284,622	14,797

a Only peak estimates listed; carcass counts included. Data in parentheses not included in totals or subtotals.

b Biosonics sonar estimate.

c Preliminary.

d Bendix side scan sonar estimate.

e U.S. Fish and Wildlife Service estimate.

f Combined foot and aerial estimate.

g Foot survey.

h Population estimate based upon replicate foot surveys and streamlife data.

i F.R.E.D. Division estimate.

j Population estimate based upon mark and recapture study.

k Sport Fish Division estimate.

n Boat survey.

q Canadian Department of Fisheries and Oceans (DFO) estimate.

r Only 331 of the chinook salmon which returned to the Fishway were passed; 41 females were artificially spawned for hatchery brood stock (average fecundity was 5,400 eggs). At least 85 more females and several males died unspawned at the Fishway as a result of warm water temperatures.

s Canadian spawning population estimates for Yukon Territory streams excluding the Fishing Branch River.

t Total for Alaskan portion of drainage does not include Fishing Branch River. Total for Yukon Territory includes Fishing Branch River.

u A total of 8 radio tagged fall chum salmon were located on this survey up the Salcha River. No estimates of other salmon nor precise spawning areas were obtained.

v This is an estimate of chum salmon already in the Sheenjek River prior to sonar operations. It is an expansion of the actual aerial survey count on August 22 of 4,076 chums.

w Stream not surveyed. Numbers are for adults sampled for AWL and/or stock ID.

Table 18. Yukon River salmon interim escapement objectives for selected species and streams, 1989. a

Stream	Interim Escapement Objectives a		
	Chinook	Summer Chum	Fall Chum
Andreafsky River			
East Fork	1,600 c	109,000 c	
West Fork	1,000 c	116,000 c	
Anvik River			
Mainstem			
Yellow River to McDonald Cr	500 c		
Goblet Cr to McDonald Cr		356,000 c	
Sonar b		487,000 d	
Nulato River			
North Fork	500 c	53,000 c	
South Fork	500 c		
Hogatza River			
Clear Creek		8,000 c	
Caribou Creek		9,000 c	
Gisasa River	650 c		
Chena River			
Mainstem from Flood Control Dam to Middle Fork	1,700 c		
Salcha River	3,500 c	3,500 c	
Sheenjok River			62,000 e
Fishing Branch River (YT)			50,000-120,000 f
Toklat River			33,000 e
Delta River			11,000 e
Mainstem Yukon River (Canadian Border)	33,000-43,000 b,g		

a Escapement objectives in numbers of fish are preliminary and are subject to change as additional data becomes available. Unless otherwise indicated, escapement objectives are based on aerial survey index estimates which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions.

b Total spawning abundance escapement objective based upon sonar, weir, and mark and recapture, or expansions from inseason point estimates.

c Interim escapement objectives developed by ADF&G in 1983.

d Optimum number calculated from escapement-return relationships.

e Interim escapement objectives developed by ADF&G in November 1987 (B.O.F.).

f Interim escapement objective developed by US/Canada JTC in October 1987.

g Interim escapement objective developed by US/Canada JTC in April 1987.

Table 19. Commercial herring catch and effort data by fishing period,
Cape Romanzof District, 1989.

Date	Hours Fished	Number			Period Catch (st)			
		Fishermen	Vessels	Landings	Bait	Sac Roe	Total	Roe %
May 26	4	111	107	197	0.0	381.9	381.9	9.17
May 27	3	67	63	109	0.0	153.5	153.5	9.01
May 29-30	3	109	106	171	1.0	180.2	181.2	9.77
May 30-31	3	91	89	145	0.0	209.3	209.3	9.38
Total	13	115	110	622	1.0	924.9	925.9	9.33

Appendix Table 1. Alaskan and Canadian total utilization of Yukon River salmon, 1903-1989. a

Year	Alaska			Canada			Total		
	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
1903						4,666			4,666
1904									
1905									
1906									
1907									
1908						7,000			7,000
1909						9,238			9,238
1910									
1911									
1912									
1913						12,133			12,133
1914						12,573			12,573
1915						10,466			10,466
1916						9,566			9,566
1917									
1918	12,239	1,500,065	1,512,304			7,066	12,239	1,500,065	1,519,370
1919	104,822	738,790	843,612			1,800	104,822	738,790	845,412
1920	78,467	1,015,655	1,094,122			12,000	78,467	1,015,655	1,106,122
1921	69,646	112,098	181,744			10,840	69,646	112,098	192,584
1922	31,825	330,000	361,825			2,420	31,825	330,000	364,245
1923	30,893	435,000	465,893			1,833	30,893	435,000	467,726
1924	27,375	1,130,000	1,157,375			4,560	27,375	1,130,000	1,161,935
1925	15,000	259,000	274,000			3,900	15,000	259,000	277,900
1926	20,500	555,000	575,500			4,373	20,500	555,000	579,873
1927		520,000	520,000			5,366		520,000	525,366
1928		670,000	670,000			5,733		670,000	675,733
1929		537,000	537,000			5,226		537,000	542,226
1930		633,000	633,000			3,660		633,000	636,660
1931	26,693	565,000	591,693			3,473	26,693	565,000	595,166
1932	27,899	1,092,000	1,119,899			4,200	27,899	1,092,000	1,124,099
1933	28,779	603,000	631,779			3,333	28,779	603,000	635,112
1934	23,365	474,000	497,365			2,000	23,365	474,000	499,365
1935	27,665	537,000	564,665			3,466	27,665	537,000	568,131
1936	43,713	560,000	603,713			3,400	43,713	560,000	607,113
1937	12,154	346,000	358,154			3,746	12,154	346,000	361,900
1938	32,971	340,450	373,421			860	32,971	340,450	374,281
1939	28,037	327,650	355,687			720	28,037	327,650	356,407
1940	32,453	1,029,000	1,061,453			1,153	32,453	1,029,000	1,062,606
1941	47,608	438,000	485,608			2,806	47,608	438,000	488,414
1942	22,487	197,000	219,487			713	22,487	197,000	220,200
1943	27,650	200,000	227,650			609	27,650	200,000	228,259
1944	14,232		14,232			986	14,232		15,218
1945	19,727		19,727			1,333	19,727		21,060
1946	22,782		22,782			353	22,782		23,135
1947	54,026		54,026			120	54,026		54,146
1948	33,842		33,842				33,842		33,842
1949	36,379		36,379				36,379		36,379
1950	41,808		41,808				41,808		41,808
1951	56,278		56,278				56,278		56,278
1952	38,637	10,868	49,505				38,637	10,868	49,505
1953	58,859	385,977	444,836				58,859	385,977	444,836
1954	64,545	14,375	78,920				64,545	14,375	78,920
1955	55,925		55,925				55,925		55,925
1956	62,208	10,743	72,951				62,208	10,743	72,951
1957	63,623		63,623				63,623		63,623
1958	75,625	337,500	413,125	11,000	1,500	12,500	86,625	339,000	425,625
1959	78,370		78,370	8,434	3,098	11,532	86,804	3,098	89,902
1960	67,597		67,597	9,653	15,608	25,261	77,250	15,608	92,858

-Continued-

Appendix Table 1. (p. 2 of 2)

Year	Alaska			Canada			Total		
	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
1961	141,152	452,521	593,673	13,246	9,076	22,322	154,398	461,597	615,995
1962	105,844	425,277	531,121	13,937	9,436	23,373	119,781	434,713	554,494
1963	141,910	401,700	543,610	10,077	27,696	37,773	151,987	429,396	581,383
1964	109,818	492,233	602,051	7,408	12,187	19,595	117,226	504,420	621,646
1965	134,706	472,798	607,504	5,380	11,789	17,169	140,086	484,587	624,673
1966	104,887	296,310	401,197	4,452	13,192	17,644	109,339	309,502	418,841
1967	146,104	335,436	481,540	5,150	16,961	22,111	151,254	352,397	503,651
1968	118,632	259,185	377,817	5,042	11,633	16,675	123,674	270,818	394,492
1969	105,027	416,623	521,650	2,624	7,776	10,400	107,651	424,399	532,050
1970	93,019	582,049	675,068	4,663	3,711	8,374	97,682	585,760	683,442
1971	136,191	530,537	666,728	6,447	16,911	23,358	142,638	547,448	690,086
1972	113,098	454,085	567,183	5,729	7,532	13,261	118,827	461,617	580,444
1973	99,670	769,023	868,693	4,522	10,135	14,657	104,192	779,158	883,350
1974	118,053	1,218,032	1,336,085	5,631	11,646	17,277	123,684	1,229,678	1,353,362
1975	76,883	1,286,437	1,363,320	6,000	20,600	26,600	82,883	1,307,037	1,389,920
1976	105,582	1,021,708	1,127,290	5,025	5,200	10,225	110,607	1,026,908	1,137,515
1977	114,338	1,090,330	1,204,668	7,527	12,479	20,006	121,865	1,102,809	1,224,674
1978	129,465	1,650,942	1,780,407	5,881	9,566	15,447	135,346	1,660,508	1,795,854
1979	158,678	1,654,445	1,813,123	10,375	22,084	32,459	169,053	1,676,529	1,845,582
1980	196,709	1,840,123	2,036,832	22,546	22,218	44,764	219,255	1,862,341	2,081,596
1981	187,708	2,115,459	2,303,167	17,809	22,281	40,090	205,517	2,137,740	2,343,257
1982	151,802	1,306,171	1,457,973	17,208	16,091	33,299	169,010	1,322,262	1,491,272
1983	197,388	1,673,071	1,870,459	18,952	29,490	48,442	216,340	1,702,561	1,918,901
1984	162,332	1,502,911	1,665,243	16,795	29,267	46,062	179,127	1,532,178	1,711,305
1985	185,959	1,597,127	1,783,086	19,301	41,265	60,566	205,260	1,638,392	1,843,652
1986	145,208	1,669,761	1,814,969	20,364	14,536	34,900	165,572	1,684,297	1,849,869
1987 ^b	187,884	1,238,559	1,426,443	17,664	44,480	62,144	205,548	1,283,039	1,488,587
1988	148,011	2,310,108	2,458,119	21,427	33,565	54,992	169,438	2,343,673	2,513,111
1989	153,560	2,258,048	2,411,608	17,944	23,020	40,964	171,504	2,281,068	2,452,572

a Commercial and subsistence harvest combined in numbers of fish, including "equivalent fish" (typically 1 lb of roe per female) converted from roe sales. See ADF&G 1985 Yukon Area Annual Management Report for data sources and methods of catch estimation used for some years.

b Includes estimates of catches involved in illegal salmon and salmon roe sales.

Appendix Table 2. Commercial chinook salmon sales by district and country, Yukon River drainage, 1961-1989. a

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total	Canada Total	Grand Total
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal			
1961	84,466	29,026	4,368	117,860	-	-	-	1,804	119,664	3,446	123,110
1962	67,099	22,224	4,687	94,010	-	-	-	724	94,734	4,037	98,771
1963	85,004	24,221	7,020	116,245	-	-	-	803	117,048	2,283	119,331
1964	67,555	20,246	4,705	92,506	-	-	-	1,081	93,587	3,208	96,795
1965	89,268	23,763	3,204	116,235	-	-	-	1,863	118,098	2,265	120,363
1966	70,788	16,927	3,612	91,327	-	-	-	1,988	93,315	1,942	95,257
1967	104,350	20,239	3,618	128,207	-	-	-	1,449	129,656	2,187	131,843
1968	79,465	21,392	4,543	105,400	-	-	-	1,126	106,526	2,212	108,738
1969	71,688	14,756	3,595	90,039	-	-	-	988	91,027	1,640	92,667
1970	56,648	17,141	3,705	77,494	-	-	-	1,651	79,145	2,611	81,756
1971	86,042	19,226	3,490	108,758	-	-	-	1,749	110,507	3,178	113,685
1972	70,052	17,855	3,841	91,748	-	-	-	1,092	92,840	1,769	94,609
1973	56,981	13,859	3,204	74,044	-	-	-	1,309	75,353	2,199	77,552
1974	71,840	17,948	3,480	93,268	685	2,663	1,473	4,821	98,089	1,808	99,897
1975	44,585	11,315	4,177	60,077	389	2,872	500	3,761	63,838	3,000	66,838
1976	62,410	16,556	4,148	83,114	409	3,151	1,102	4,662	87,776	3,500	91,276
1977	69,915	16,722	3,965	90,602	985	4,162	1,008	6,155	96,757	4,720	101,477
1978	59,006	32,924	2,916	94,846	608	3,079	635	4,322	99,168	2,975	102,143
1979	75,007	41,498	5,018	121,523	1,989	3,389	772	6,150	127,673	6,175	133,848
1980	90,382	50,004	5,240	145,626	1,521	4,891	1,947	8,359	153,985	9,500	163,485
1981	99,506	45,781	4,023	149,310	1,347	6,374	987	8,708	158,018	8,593	166,611
1982	74,450	39,132	2,609	116,191	1,087	5,385	981	7,453	123,644	8,640	132,284
1983	95,457	43,229	4,106	142,792	601	3,606	911	5,118	147,910	13,027	160,937
1984	74,671	36,697	3,039	114,407	961	3,669	867	5,497	119,904	9,885	129,789
1985	90,011	48,365	2,588	140,964	664	3,418	1,142	5,224	146,188	12,573	158,761
1986	53,035	41,849	901	95,785	502	2,733	950	4,185	99,970	10,797	110,767
1987	76,643	47,458	2,039	126,140	1,524	3,758 b	3,338 c	8,620	134,760	10,864	145,624
1988	57,109	35,188	1,767	94,064	3,159	3,436	762	7,357	101,421	13,217	114,638
1989	59,153	33,225	1,645	94,023	2,790	3,286	1,741 d	7,817	101,840	9,789	111,629
5 Yr Ave											
1979-83	86,960	43,929	4,199	135,088	1,309	4,729	1,120	7,158	142,246	9,187	151,433
5 Yr Ave											
1984-88	70,294	41,911	2,067	114,272	1,362	3,403	1,412	6,177	120,449	11,467	131,916

a Sales reported in numbers of fish sold in the round.

b Includes illegal sales of 653 chinook salmon.

c Includes illegal sales of 2,136 chinook salmon.

d Does not include 440 chinook salmon sold as part of a test fishing project in District 6.

Appendix Table 3. Commercial summer chum salmon sales by district, Yukon River drainage, 1961-1989. a

Year	Lower Yukon Area				Upper Yukon Area								Alaska Total	
					Dist. 4		Dist. 5		Dist. 6		Subtotal			
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	
1961	-	-	-	0	-	-	-	-	-	-	0	-	0	0
1962	-	-	-	0	-	-	-	-	-	-	0	-	0	0
1963	-	-	-	0	-	-	-	-	-	-	0	-	0	0
1964	-	-	-	0	-	-	-	-	-	-	0	-	0	0
1965	-	-	-	0	-	-	-	-	-	-	0	-	0	0
1966	-	-	-	0	-	-	-	-	-	-	0	-	0	0
1967	9,453	1,425	57	10,935	-	-	-	-	-	-	0	-	0	10,935
1968	12,995	1,407	68	14,470	-	-	-	-	-	-	0	-	0	14,470
1969	56,886	5,080	-	61,966	-	-	-	-	-	-	0	-	0	61,966
1970	117,357	19,649	-	137,006	-	-	-	-	-	-	0	-	0	137,006
1971	93,928	6,112	50	100,090	-	-	-	-	-	-	0	-	0	100,090
1972	114,234	20,907	527	135,668	-	-	-	-	-	-	0	-	0	135,668
1973	221,644	63,402	463	285,509	-	-	-	-	-	-	0	-	0	285,509
1974	466,004	74,152	1,721	541,877	27,866	-	6,831	-	13,318	-	48,015	-	0	589,892
1975	418,323	99,139	-	517,462	165,054	-	12,997	-	14,782	-	192,833	-	0	710,295
1976	273,204	99,190	9,802	382,196	211,307	-	774	-	6,617	-	218,698	-	0	600,894
1977	250,652	105,679	3,412	359,743	169,541	-	1,274	-	4,317	-	175,132	-	0	534,875
1978	393,785	227,548	27,003	648,336	364,184	16,920	4,892	605	34,814	8,236	403,890	25,761	1,052,226	
1979	369,934	172,838	40,015	582,787	169,430	35,317	8,608	1,009	18,491	3,891	196,529	40,217	779,316	
1980	391,252	308,704	44,782	744,738	147,560	135,824	456	-	35,855	3,282	183,871	139,106	928,609	
1981	507,158	351,878	54,471	913,507	59,718	187,032	1,236	49	32,477	1,987	93,431	189,068	1,006,938	
1982	249,516	182,344	4,086	435,946	3,647	151,281	213	21	21,597	1,517	25,457	152,819	461,403	
1983	451,164	248,092	14,600	713,856	6,672	148,125	42	1,856	24,309	18	31,023	149,999	744,879	
1984	292,676	236,931	1,087	530,694	1,009	166,842	645	47	56,249	335	57,903	167,224	588,597	
1985	247,486	188,099	1,792	437,377	12,007	247,085	700	-	66,913	1,540	79,620	248,625	516,997	
1986	381,127	288,427	442	669,996	300	269,545	690	-	50,483	2,146	51,473	271,691	721,469	
1987	222,898	174,876	3,501	401,275	29,991	121,474	362	44	10,610	450	40,963	121,968	442,238	
1988	648,198	425,172	13,965	1,087,335	24,051	254,526	722	363	40,129	1,646	64,902	256,535	1,152,237	
1989	547,631	343,962	7,578	899,171	18,554	283,305	154	373	42,115 c	4,871	60,823 c	288,549	959,994 c	
5 Yr Ave														
1979-83	393,805	252,771	31,591	678,167	77,405	131,516	2,111	587	26,546	2,139	106,062	134,242	784,229	
5 Yr Ave														
1984-88	358,477	262,701	4,157	625,335	13,472	211,894	624	91	44,877	1,223	58,972	213,209	684,308	

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.

b May include small amounts of chinook salmon roe.

c Does not include 6,267 summer chum salmon sold as part of a test fishing project in District 6.

Appendix Table 4. Commercial fall chum salmon sales by district and country, Yukon River drainage, 1961-1989. a

Year	Lower Yukon Area				Upper Yukon Area								Alaska Total		Canada Total	Grand Total
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4		Dist. 5		Dist. 6		Subtotal	Roe b	Numbers			
					Numbers	Roe b	Numbers	Roe b	Numbers	Roe b				Numbers		
1961	42,461	-	-	42,461	-	-	-	-	-	-	0	0	42,461	3,276	45,737	
1962	53,116	-	-	53,116	-	-	-	-	-	-	0	0	53,116	936	54,052	
1963	-	-	-	0	-	-	-	-	-	-	0	0	0	2,196	2,196	
1964	8,347	-	-	8,347	-	-	-	-	-	-	0	0	8,347	1,929	10,276	
1965	22,936	-	-	22,936	-	-	-	-	-	-	381	0	23,317	2,071	25,388	
1966	69,836	-	1,209	71,045	-	-	-	-	-	-	0	0	71,045	3,157	74,202	
1967	36,451	-	1,823	38,274	-	-	-	-	-	-	0	0	38,274	3,343	41,617	
1968	49,857	-	3,068	52,925	-	-	-	-	-	-	0	0	52,925	453	53,378	
1969	128,866	-	1,722	130,588	-	-	-	-	-	-	722	0	131,310	2,279	133,589	
1970	200,306	4,858	3,285	208,449	-	-	-	-	-	-	1,146	0	209,595	2,479	212,074	
1971	188,533	-	-	188,533	-	-	-	-	-	-	1,061	0	189,594	1,761	191,355	
1972	136,711	12,898	1,313	150,922	-	-	-	-	-	-	1,254	0	152,176	2,532	154,708	
1973	173,783	45,304	-	219,087	-	-	-	-	-	-	13,003	0	232,090	2,806	234,896	
1974	176,036	53,540	552	230,128	9,213	-	23,551	-	26,884	-	59,648	0	289,776	2,544	292,320	
1975	158,183	51,666	5,590	215,439	13,666	-	27,212	-	18,692	-	59,570	0	275,009	2,500	277,509	
1976	105,851	21,212	4,250	131,313	1,742	-	5,387	-	17,948	-	25,077	0	156,390	1,000	157,390	
1977	131,758	51,994	15,851	199,603	13,980	-	25,730	-	18,673	-	58,383	0	257,986	3,990	261,976	
1978	127,947	51,646	11,527	191,120	10,988	1,721	21,016	5,220	13,259	3,687	45,263	10,628	236,383	3,356	239,739	
1979	109,406	94,042	25,955	229,403	48,899	3,199	47,459	8,097	34,185	7,170	130,543	18,466	359,946	9,084	369,030	
1980	106,829	83,881	13,519	204,229	27,978	4,347	41,771	605	19,452	68	89,201	5,020	293,430	9,000	302,430	
1981	167,834	154,883	19,043	341,760	12,082	1,311	86,620	6,955	25,989	3,019	124,691	11,285	466,451	15,260	481,711	
1982	97,484	96,581	5,815	199,880	3,894	167	13,593	42	6,820	596	24,307	805	224,187	11,312	235,499	
1983	124,371	85,645	10,018	220,034	4,482	1,963	43,993	0	34,089	3,101	82,564	5,064	302,598	25,990	328,588	
1984	78,751	70,803	6,429	155,983	7,625	2,215	24,060	57	20,564	56	52,249	2,328	208,232	22,932	231,164	
1985	129,948	40,490	5,164	175,602	24,452	2,525	25,338	0	42,352	0	92,142	2,525	267,744	35,746	303,490	
1986	59,352	51,307	2,793	113,452	2,045	0	22,053	395	1,892	182	25,990	577	139,442	11,464	150,906	
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	40,591	40,591	
1988	45,529	31,861	2,090	79,480	15,662	1,421	16,989	0	21,844 c	1,806	54,495	3,227	133,975 c	30,263	164,238 c	
1989	77,876	97,906	15,332	191,114	11,776	3,407	18,215	3,989	49,090 d	7,353	79,081	14,749	270,195 d	17,549	287,144 d	
5 Yr Ave 1979-83	121,185	103,006	14,870	239,061	19,467	2,197	46,687	3,140	24,107	2,791	90,261	8,128	329,322	14,129	343,452	
5 Yr Ave 1984-88	62,716	38,892	3,295	104,903	9,957	1,232	17,688	90	17,330	409	44,975	1,731	149,879	28,199	178,078	

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.

b May include small amounts of coho salmon roe.

c Does not include 26,988 fall chum salmon sold as part of a test fishing project.

d Does not include 16,984 fall chum salmon sold as part of a test fishing project.

Appendix Table 5. Commercial coho salmon sales by district, Yukon River drainage, 1961-1989. a

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total
	Dist.1	Dist.2	Dist.3	Subtotal	Dist.4	Dist.5	Dist.6	Subtotal	
1961	2,855	-	-	2,855	-	-	-	0	2,855
1962	22,926	-	-	22,926	-	-	-	0	22,926
1963	5,572	-	-	5,572	-	-	-	0	5,572
1964	2,446	-	-	2,446	-	-	-	0	2,446
1965	350	-	-	350	-	-	-	0	350
1966	19,254	-	-	19,254	-	-	-	0	19,254
1967	9,925	-	1,122	11,047	-	-	-	0	11,047
1968	13,153	-	150	13,303	-	-	-	0	13,303
1969	13,989	-	1,009	14,998	-	-	-	95	15,093
1970	12,632	-	-	12,632	-	-	-	556	13,188
1971	12,165	-	-	12,165	-	-	-	38	12,203
1972	21,705	506	-	22,211	-	-	-	22	22,233
1973	34,860	1,781	-	36,641	-	-	-	0	36,641
1974	13,713	176	-	13,889	-	1,409	1,479	2,888	16,777
1975	2,288	200	-	2,488	-	5	53	58	2,546
1976	4,064	17	-	4,081	-	-	1,103	1,103	5,184
1977	31,720	5,319	538	37,577	-	2	1,284	1,286	38,863
1978	16,460	5,835	758	23,053	32	1	3,066	3,099	26,152
1979	11,369	2,850	-	14,219	155	-	2,791	2,946	17,165
1980	4,829	2,660	-	7,489	30	-	1,226	1,256	8,745
1981	13,129	7,848	419	21,396	-	-	2,284	2,284	23,680
1982	15,115	14,179	87	29,381	15	-	7,780	7,795	37,176
1983	4,595	2,557	-	7,152	-	-	6,168	6,168	13,320
1984	29,472	43,064	621	73,157	1,095	-	7,688	8,783	81,940
1985	27,676	17,125	171	44,972	938	-	11,762	12,700	57,672
1986	24,824	21,197	793	46,814	-	-	441	441	47,255
1987	0	0	0	0	0	0	0	0	0
1988	36,435	34,776	1,419	72,630	2	8	13,972 b	13,982 b	86,612 b
1989	24,672	38,522	3,988	67,182	3	84	16,084 c	16,171 c	83,353 c
5 Yr Ave									
1979-83	9,807	6,019	101	15,927	40	0	4,050	4,090	20,017
5 Yr Ave									
1984-88	23,681	23,232	601	47,515	407	2	6,773	7,181	54,696

a Sales reported in numbers of fish sold in the round.

b Does not include 13,295 coho salmon sold as part of a test fishing project.

c Does not include 2,140 coho salmon sold as part of a test fishing project.

Appendix Table 6. Yukon River drainage total estimated commercial related summer chum salmon catch by area and district, 1968-1989.

Upper Yukon Area													
Lower Yukon		District 4				District 5			District 6			Alaska	
Year	Area Total	Sold in Round	Females a	Unsold Males	Subtotal b	Numbers	Females a	Subtotal b	Numbers	Females a	Subtotal b	Total b	Total b
1968	14,470	-	-	-	0	-	-	0	-	-	0	0	14,470
1969	61,966	-	-	-	0	-	-	0	-	-	0	0	61,966
1970	137,006	-	-	-	0	-	-	0	-	-	0	0	137,006
1971	100,090	-	-	-	0	-	-	0	-	-	0	0	100,090
1972	135,668	-	-	-	0	-	-	0	-	-	0	0	135,668
1973	285,509	-	-	-	0	-	-	0	-	-	0	0	285,509
1974	541,877	27,866	-	-	27,866	6,831	-	6,831	13,318	-	13,318	48,015	589,892
1975	517,462	165,054	-	-	165,054	12,997	-	12,997	14,782	-	14,782	192,833	710,295
1976	382,196	211,307	-	-	211,307	774	-	774	6,617	-	6,617	218,698	600,894
1977	359,743	169,541	-	-	169,541	1,274	-	1,274	4,317	-	4,317	175,132	534,875
1978	648,336	364,184	16,920	0	381,104	4,892	605	5,497	34,814	8,236	43,050	429,651	1,077,987
1979	582,787	169,430	35,317	0	204,747	8,608	1,009	9,617	18,491	3,891	22,382	236,746	819,533
1980	744,738	147,560	135,824	0	283,384	456	-	456	35,855	3,282	39,137	322,977	1,067,715
1981	913,507	59,718 c	187,032	83,695 d	330,445	1,236	49	1,285	32,477	1,987	34,464	366,194	1,279,701
1982	435,946	3,647 c	151,281	102,791 d	257,719	213	21	234	21,597	1,517	23,114	281,067	717,013
1983	713,856	6,672 c	148,125	100,591 d	255,388	42	1,856	1,898	24,309	18	24,327	281,613	995,469
1984	530,694	1,009 c	166,842	110,219 d	278,070	645	47	692	56,249	335	56,584	335,346	866,040
1985	437,377	12,007 c	247,085	168,391 d	427,483	700	-	700	66,913	1,540	68,453	496,636	934,013
1986	669,996	300 c	269,545	195,690 e	465,535	690	-	690	50,483	2,146	52,629	518,854	1,188,850
1987	401,275	29,991 c	121,474	58,335 e	209,800	362	44	406	10,610	450	11,060	221,266	622,541
1988	1,087,335	24,051 c	283,753	182,270 e	490,074	722	405	1,127	40,129	1,835	41,964	533,165	1,620,500
1989	899,171	18,554 c	316,222	175,468 f	510,244	154	416	570	42,115 g	5,436	47,551	558,365	1,457,536
5 Yr Ave													
1984-88	625,335	13,472	217,740	142,981	374,192	624	99	723	44,877	1,261	46,138	421,053	1,046,389

- a Estimated by dividing pounds of unprocessed roe by 1 lb of roe per female (1978-1987), 0.897 lbs (1988), and 0.896 lbs (1989), which was calculated from data collected in District 4.
- b Subtotals may not be the same as those in Appendix Table 29, since a number of females stripped of roe and incidental males are reported as subsistence catches.
- c Assume all fish sold in the round were males.
- d Calculated by dividing estimated number of females by proportion of females captured at Stink Creek test fishwheel (1981 - .566; 1982 - .587; 1983 - .580; 1984 - .600; and 1985 - .578), subtracted by pounds of roe and fish sold in the round.
- e Calculated by dividing estimated number of females by proportion of females captured at Stink Creek test fishery (1981-1985 average - .579), subtracted by pounds of roe and fish sold in the round.
- f Estimate of number of males taken which were not sold based on mean proportion of females (0.62) sampled in District 4 in 1989.
- g Does not include test fishing sales.

Appendix Table 7. Commercial Fisheries Entry Commission (CFEC) salmon permits issued by gear type, Yukon Area, 1976-1989. a

Year	Lower Yukon Gill Net b		Upper Yukon Gill Net c		Upper Yukon Fishwheel	
	Permits Issued d	Permits Fished	Permits Issued d	Permits Fished	Permits Issued d	Permits Fished
1976	678	e	118	e	169	e
1977	700	609	69	44	160	130
1978	699	650	71	47	158	137
1979	708	661	70	50	165	129
1980	709	654	71	52	163	128
1981	711	666	70	45	162	125
1982	710	664	76	45	166	111
1983	708	655	73	40	164	115
1984	708	674	73	39	159	99
1985	708	664	71	40	159	113
1986	707	670	71	30	161	101
1987	706	656	71	33	161	108
1988	707	677	71	43 f	160	127 f
1989	716	687 f	75	42 f	160	127 f

a Information for 1976-1988 obtained from CFEC unless otherwise indicated.

b Set or drift gill net.

c Set gill net only.

d Includes permanent and interim-use permits.

e Information unavailable.

f Data source: ADF&G.

Appendix Table 8. Number of commercial salmon fishing gear operators (permit holders) by district, Yukon area, 1971-1989. a

CHINOOK SALMON SEASON									
Lower Yukon Area b					Upper Yukon Area				Total
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	
1971	405	154	33	592	-	-	-	-	592
1972	426	153	35	614	-	-	-	-	614
1973	438	167	38	643	-	-	-	-	643
1974	396	154	42	592	27	31	20	78	670
1975	441	149	37	627	93	52	36	181	808
1976	453	189	42	684	80	46	29	155	839
1977	392	188	46	626	87	41	18	146	772
1978	429	204	22	655	80	45	35	160	815
1979	425	210	22	657	87	34	30	151	808
1980	407	229	21	657	79	35	33	147	804
1981	448	225	23	696	80	43	26	149	845
1982	450	225	21	696	74	44	20	138	834
1983	444	212	19	675	77	34	25	136	811
1984	439	213	20	672	54	31	27	112	784
1985	421	219	18	658	74	32	27	133	791
1986	431	235	7	673	75	21	27	123	796
1987	432	233	10	675	87	30	24	141	816
1988	437	234	13	684	95	28	33	156	840
1989	434	236	16	686	98	32	29	159	845

FALL SEASON									
Lower Yukon Area c					Upper Yukon Area d				Total
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	
1971	352	-	-	352	-	-	-	-	352
1972	353	75	3	431	-	-	-	-	431
1973	445	183	-	628	-	-	-	-	628
1974	322	121	6	449	17	23	22	62	511
1975	428	185	12	625	44	33	33	110	735
1976	422	194	28	644	18	36	44	98	742
1977	337	172	37	546	28	34	32	94	640
1978	429	204	28	661	24	43	30	97	758
1979	458	220	32	710	31	44	37	112	822
1980	395	232	23	650	33	43	26	102	752
1981	462	240	21	723	30	50	30	110	833
1982	445	218	15	678	15	24	25	64	742
1983	455	225	20	700	13	29	23	65	765
1984	427	216	12	655	18	39	26	83	738
1985	416	236	13	665	22	39	25	86	751
1986	377	236	14	627	1	21	16	38	665
1987	403	230	9	642	0	0	0	0	642
1988	453	258	24	735	20	20	32	72	807
1989	445	243	23	711	20	24	28	72	783

COMBINED SEASONS									
Lower Yukon Area					Upper Yukon Area				Total
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	
1971	473	154	33	660	-	-	-	27	687
1972	476	153	35	664	-	-	-	-	664
1973	529	205	38	772	-	-	-	47	819
1974	485	190	42	717	28	43	27	98	815
1975	491	197	39	727	95	57	46	198	925
1976	482	220	44	746	96	62	56	214	960
1977	402	208	54	664	96	53	39	188	852
1978	472	221	29	722	82	53	38	173	895
1979	461	230	33	724	90	49	40	179	903
1980	432	247	27	706	88	51	38	177	883
1981	507	257	26	790	94	56	31	181	971
1982	486	244	22	752	76	53	27	156	908
1983	458	235	26	719	79	47	31	157	876
1984	453	238	26	717	58	45	33	136	853
1985	434	247	24	705	76	48	33	157	862
1986	444	259	18	721	75	30	27	132	853
1987	440	239	13	692	87	30	24	141	833
1988	460	260	24	744	97	35	38	170	914
1989	452	257	23	732	99	38	32	169	901

- a Actual number of gear operators which delivered. Some individual fishermen in the Lower Yukon Area may have operated in more than one district during the year.
b Unrestricted mesh size fishing periods.
c Refers to 6" or smaller mesh size restriction after the chinook salmon season.
d Refers to time when fall chum salmon fishery occurs.

Appendix Table 9. Commercial chinook salmon catches by statistical area, Lower Yukon Area, 1974-1989.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1974	2,935	30,174	6,984	3,987	12,721	2,048	6,826	6,165	71,840
1975	6,396	15,844	8,763	314	1,720	606	6,879	4,063	44,585
1976	8,333	27,937	7,507	851	5,101	1,415	6,164	5,102	62,410
1977	11,278	16,787	8,866	1,216	15,214	1,550	7,109	7,895	69,915
1978	886	12,237	4,135	4,388	22,019	3,738	7,533	4,070	59,006
1979	1,017	13,152	4,149	5,782	12,839	10,960	18,976	8,202	75,077
1980	464	12,832	3,235	9,224	30,737	12,333	13,654	7,903	90,382
1981	6,639	12,875	2,975	8,976	19,730	15,158	22,251	10,902	99,506
1982	3,439	11,268	2,842	9,038	9,331	7,295	18,185	13,052	74,450
1983	7,919	23,523	8,161	14,961	9,416	5,297	19,172	7,008	95,457
1984	14,385	15,320	2,598	6,297	11,123	1,434	19,089	4,425	74,671
1985	4,233	22,696	12,160	2,492	12,806	3,955	25,144	6,525	90,011
1986	4,187	7,954	3,494	5,430	10,258	1,422	15,948	4,342	53,035
1987	14,656	12,056	8,703	3,533	6,780	3,250	18,573	9,092	76,643
1988	6,780	11,154	6,023	4,274	14,123	618	8,703	5,434	57,109
1989	2,213	5,703	4,794	3,999	12,682	7,303	18,037	4,422	59,153

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1974	6,344	5,611	2,624	3,369	-	17,948
1975	3,282	3,045	2,785	2,203	-	11,315
1976	5,083	4,490	3,031	3,952	-	16,556
1977	6,577	4,584	2,110	3,451	-	16,722
1978	9,004	7,953	5,248	8,499	2,220	32,924
1979	10,698	11,214	6,733	7,573	5,280	41,498
1980	11,544	12,903	8,259	9,591	7,707	50,004
1981	12,341	13,275	7,024	5,950	7,191	45,781
1982	10,567	9,236	5,262	8,932	5,135	39,132
1983	12,433	10,424	7,779	6,260	6,333	43,229
1984	9,179	11,573	4,668	5,752	5,525	36,697
1985	11,843	18,584	4,877	4,613	8,448	48,365
1986	11,138	15,326	3,450	4,336	7,599	41,849
1987	14,195	9,672	5,663	6,376	11,552	47,458
1988	6,191	11,605	4,721	6,784	5,887	35,188
1989	5,257	12,380	4,647	4,411	6,530	33,225

District 3

Year	334-31	334-32	Total
1974	1,423	2,057	3,480
1975	2,791	1,386	4,177
1976	1,827	2,321	4,148
1977	1,617	2,348	3,965
1978	746	2,170	2,916
1979	2,195	2,823	5,018
1980	2,039	3,201	5,240
1981	1,241	2,782	4,023
1982	896	1,713	2,609
1983	1,335	2,771	4,106
1984	900	2,139	3,039
1985	854	1,734	2,588
1986	606	295	901
1987	1,698	341	2,039
1988	1,387	380	1,767
1989	1,623	22	1,645

Appendix Table 10. Commercial chinook salmon catches by statistical area, Upper Yukon Area, 1974-1989.

District 4

Year	334-41	334-42	334-43	Total
1974	0	685	-	685
1975	15	374	-	389
1976	44 ^a	365	-	409
1977	317	668	-	985
1978	183	425	-	608
1979	785	370	834	1,989
1980	352	549	620	1,521
1981	106	867	374	1,347
1982	78	497	512	1,087
1983	0	382	219	601
1984	2	272	687	961
1985	0	318	346	664
1986	11	100	391	502
1987	91	999	434	1,524
1988	19	1,599	1,541	3,159
1989	59	696	2,035	2,790

District 5

Year	334-51	334-52	334-53	334-54	Total
1974	2,284	379	-	-	2,663
1975	2,602	270	-	-	2,872
1976	2,843	308	-	-	3,151
1977	4,013	149	-	-	4,162
1978	2,838	241	-	-	3,079
1979	3,389	0	-	-	3,389
1980	4,554	337	-	-	4,891
1981	97	3,051	2,477	749	6,374
1982	61	2,352	2,277	695	5,385
1983	0	632	2,738	236	3,606
1984	128	1,589	1,568	384	3,669
1985	0	1,142	1,842	434	3,418
1986	0	1,552	875	306	2,733
1987	0	1,183	1,356	566	3,105
1988	0	1,498	1,477	461	3,436
1989	31	1,411	1,459	385	3,286

District 6

Year	334-61	334-62	334-63	Total
1974	111	1,102	260	1,473
1975	77	153	270	500
1976	490	320	292	1,102
1977	405	365	238	1,008
1978	34	58	543	635
1979	102	336	334	772
1980	92	1,588	267	1,947
1981	438	366	183	987
1982	414	309	258	981
1983	249	364	298	911
1984	0	375	492	867
1985	15	560	567	1,142
1986	0	597	353	950
1987	0	600	602	1,202
1988	305	253	204	762
1989	809	614	318	1,741

^a Does not include 493 fish (summer chum salmon) erroneously keypunched as chinook salmon in final computer summary.

Appendix Table 11. Commercial catches of chinook and summer chum salmon by mesh size, Districts 1 and 2, Lower Yukon Area, 1961-1989.

	Unrestricted Mesh Size a		6 inch Max. Mesh Size b	
	Districts 1 and 2		Districts 1 and 2	
Year	Chinook	Summer Chum	Chinook	Summer Chum
1961	113,434	-	-	-
1962	89,296	-	-	-
1963	109,215	-	-	-
1964	87,801	-	-	-
1965	113,031	-	-	-
1966	87,710	-	-	-
1967	124,574	10,919	-	-
1968	100,857	14,402	-	-
1969	85,387	41,418	97	15,437
1970	73,610	104,705	57	16,623
1971	103,623	42,189	1,176	57,851
1972	85,376	78,698	1,991	37,881
(Avg. 1961-72)	97,826	48,722	830	31,948
1973 c	65,269	89,841	5,168	196,540
1974	86,921	349,758	1,631	227,507
1975	50,614	148,919	4,162	345,472
1976	71,688	267,075	7,631	128,431
1977	81,073	157,909	4,720	205,634
1978	82,070	275,512	7,737	354,603
1979	95,137	136,973	22,136	434,188
1980	120,912	95,876	19,474	605,679
1981	125,698	163,979	18,648	758,767
1982	106,399	225,106	6,887	217,563
1983	107,078	121,927	31,002	590,329
1984	94,456	242,076	16,394	287,531
1985 d	114,300	170,345	22,445	265,240
1986	79,525	231,372	15,307	438,182
1987	102,274	128,017	21,827	269,757
1988	52,801	225,049	39,469	848,321
1989	53,674	126,360	38,548	765,233
(Avg. 1979-89)	95,659	169,735	22,922	498,254

a Primarily 8 to 8-1/2 inch mesh size used during early June to early July.

b Catch through July 15-20, relatively few chinook and summer chum salmon taken after these dates.

c Six inch maximum mesh size regulation beginning late June to early July became effective in 1973.

d Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 12. Commercial chinook salmon catch and effort data, Districts 1 and 2, Lower Yukon Area, 1961-1989. a

Commercial Catch			
Year	Dist. 1	Dist. 2	Total
1961	84,406	29,028	113,434
1962	67,072	22,224	89,296
1963	85,004	24,211	109,215
1964	67,555	20,246	87,801
1965	89,268	23,763	113,031
1966	70,783	16,927	87,710
1967	104,335	20,239	124,574
1968	79,465	21,392	100,857
1969	70,588	14,799	85,387
1970	56,469	17,141	73,610
1971	84,397	19,226	103,623
1972	68,059	17,317	85,376
1973	52,790	12,479	65,269
1974	69,457	17,464	86,921
1975	41,550	9,064	50,614
1976	56,392	15,296	71,688
1977	65,745	15,328	81,073
1978	53,198	28,872	82,070
1979	61,790	33,347	95,137
1980	78,157	42,755	120,912
1981	88,038	37,660	125,698
1982	70,743	35,656	106,399
1983	76,280	30,798	107,078
1984	65,101	29,355	94,456
1985	76,106	38,194	114,300
1986	42,922	36,603	79,525
1987	62,147	40,127	102,274
1988	32,792	20,009	52,801
1989	32,180	21,494	53,674

Effort						
	District 1		District 2		Total	
	Boat Hrs	CPUE	Boat Hrs	CPUE	Boat Hrs	CPUE
1961	79,224	1.07	29,118	1.00	108,342	1.05
1962	84,792	0.79	38,118	0.58	122,910	0.73
1963	72,288	1.18	27,672	0.87	99,960	1.09
1964	56,736	1.19	22,398	0.90	79,134	1.11
1965	78,096	1.14	31,008	0.77	109,104	1.04
1966	69,894	1.01	22,380	0.76	92,274	0.95
1967	102,456	1.02	37,488	0.54	139,944	0.89
1968	92,450	0.86	32,280	0.66	124,730	0.81
1969	84,864	0.83	27,828	0.53	112,692	0.76
1970	61,260	0.92	20,460	0.84	81,720	0.90
1971	73,272	1.15	19,956	0.96	93,228	1.11
1972	79,236	0.86	19,872	0.87	99,108	0.86
1973	75,036	0.70	23,496	0.53	98,532	0.66
1974	86,256	0.81	29,808	0.59	116,064	0.75
1975	49,944	0.83	8,376	1.08	58,320	0.87
1976	64,572	0.87	23,484	0.65	88,056	0.81
1977	42,618	1.54	15,180	1.01	57,798	1.40
1978	57,528	0.92	25,524	1.13	83,052	0.99
1979	53,040	1.16	23,904	1.40	76,944	1.24
1980	45,348	1.72	20,196	2.12	65,544	1.84
1981	43,632	2.02	19,536	1.93	63,168	1.99
1982	55,416	1.28	22,008	1.62	77,424	1.37
1983	38,448	1.98	18,696	1.65	57,144	1.87
1984	38,880	1.67	14,568	2.02	53,448	1.77
1985	28,176	2.70	14,832	2.58	43,008	2.66
1986	36,936	1.16	20,352	1.80	57,288	1.39
1987	32,796	1.89	18,696	2.15	51,492	1.99
1988	14,280	2.30	7,884	2.54	22,164	2.38
1989	11,994	2.68	6,888	3.12	18,882	2.84

a Chinook salmon season during June and early July with unrestricted mesh size gill nets.

Appendix Table 13. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 1, Lower Yukon Area, 1974-1989.

Period Catch a (Cumulative Catch) b																
Date	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
06/01																
06/02																
06/03																
06/04																
06/05	3.5(3.5)					6.1(6.1)										
06/06																
06/07								11.1(11.1)								
06/08	7.5(11.0)					4.9(11.0)										
06/09					2.5(2.5)			15.6(26.7)								
06/10							6.8(6.8)			22.3(22.3)						
06/11		0.2(0.2)														
06/12	14.7(25.7)					19.5(30.5)		14.5(41.2)								
06/13					5.8(8.3)											
06/14		0.4(0.6)		0.04(0.04)			26.1(32.9)			12.7(35.0)					5.9(5.9)	
06/15	11.1(36.8)								5.6(5.6)							
06/16			0.1(0.1)			9.3(39.8)		18.3(59.5)						13.0(13.0)		18.9(18.9)
06/17					17.6(25.9)		14.6(47.5)			28.6(63.6)					16.0(21.9)	
06/18		1.1(1.7)		2.6(2.6)					12.4(18.0)							
06/19	18.8(55.6)		3.2(3.3)			16.7(56.5)		28.5(88.0)			13.7(13.7)			22.5(35.5)		
06/20					7.5(33.4)								21.7(21.7)			10.8(29.7)
06/21		5.7(7.4)		10.4(13.0)			26.2(73.7)			12.7(76.3)					10.9(32.8)	
06/22	2.9(58.5)					5.3(61.8)			20.0(38.0)		18.8(32.5)					2.5(32.2)
06/23			9.6(12.9)				4.5(78.2)							15.0(50.5)		
06/24					14.4(47.8)								10.2(31.9)			
06/25		17.1(24.5)		26.3(39.3)					7.1(45.1)			23.6(23.6)				
06/26	7.2(65.7)		15.4(28.3)								16.1(48.6)			11.6(62.1)		
06/27		9.8(34.3)			5.4(53.2)											
06/28				17.7(57.0)								33.7(57.3)				
06/29	3.8(69.5)								18.1(63.2)		16.5(65.1)					
06/30			13.8(42.1)										5.6(37.5)			
07/01		7.3(41.6)		8.7(65.7)												
07/02			14.3(56.4)						7.5(70.7)			18.8(76.1)				
07/03																
07/04																
07/05													5.4(42.9)			
07/06																
07/07																
07/08																

a Catch by period in thousands of fish.

b Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 14. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 2, Lower Yukon Area, 1978-1989.

Date	Period Catch a (Cumulative Catch) b											
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
06/01												
06/02												
06/03												
06/04		1.6 (1.6)										
06/05												
06/06												
06/07		1.4 (3.0)										
06/08				7.6 (7.6)								
06/09	4.8 (4.8)		3.9 (3.9)									
06/10												
06/11		5.1 (8.1)		11.4 (19.0)								
06/12	3.2 (8.0)		7.8 (11.7)									
06/13						6.0 (6.0)						
06/14												
06/15		14.2 (22.3)		10.5 (29.5)								
06/16	4.3 (12.3)		10.9 (22.6)			7.3 (13.3)					2.7 (2.7)	
06/17					4.0 (4.0)							
06/18		3.9 (26.2)		8.2 (37.7)						9.5 (9.5)		
06/19	7.8 (20.1)											11.0(11.0)
06/20			8.1 (30.7)			10.6 (23.9)					9.0 (11.7)	
06/21		7.2 (33.4)			7.8 (11.8)		5.6 (5.6)					
06/22										12.2 (21.7)		7.5(18.5)
06/23	4.1 (24.2)		12.0 (42.7)			6.9 (30.8)			14.5 (14.5)		8.3 (20.0)	
06/24					11.9 (23.7)							
06/25							14.4 (20.0)			10.9 (32.5)		3.0(21.5)
06/26	4.7 (28.9)											
06/27								7.0 (7.0)	12.3 (26.8)			
06/28					3.4 (27.1)		9.4 (29.4)					
06/29										7.6 (40.1)		
06/30												
07/01					8.6 (35.7)			18.3 (25.3)				
07/02									7.4 (34.2)			
07/03												
07/04								12.9 (38.2)				
07/05												
07/06												
07/07									2.4 (36.6)			
07/08												

a Catch by period in thousands of fish.

b Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 15. Commercial salmon catches taken under quotas or guideline harvest ranges, Yukon Area, 1974-1989.

Chinook Salmon a					
Year	Lower Yukon Area		Upper Yukon Area		
	Districts 1 and 2	District 3	District 4	District 5	District 6
1974	-	3,480 (3,000)	685 (1,000)	2,663 (3,000)	1,473 (1,000)
1975	-	4,177 (3,000)	389 (1,000)	2,872 (3,000)	500 (1,000)
1976	-	4,148 (3,000)	409 (1,000)	3,151 (3,000)	1,102 (1,000)
1977	-	3,965 (3,000)	985 (1,000)	4,162 (3,000)	1,008 (1,000)
1978	-	2,916 (2,000)	608 (1,000)	3,079 (3,000)	635 (1,000)
1979 b	-	5,018 (1,800-2,200)	1,989 (900-1,100)	3,389 (2,700-3,300)	772 (900-1,100)
1980	-	5,240 (1,800-2,200)	1,521 (900-1,100)	4,891 (2,700-3,300)	1,947 (900-1,100)
1981	145,287 (60,000-120,000)	4,023 (1,800-2,200)	1,347 (2,250-2,850)	6,374 (2,700-3,300)	987 (600-800)
1982	113,582 (60,000-120,000)	2,609 (1,800-2,200)	1,087 (2,250-2,850)	5,385 (2,700-3,300)	981 (600-800)
1983	138,686 (60,000-120,000)	4,106 (1,800-2,200)	601 (2,250-2,850)	3,606 (2,700-3,300)	911 (600-800)
1984	111,368 (60,000-120,000)	3,039 (1,800-2,200)	961 (2,250-2,850)	3,669 (2,700-3,300)	867 (600-800)
1985	138,376 (60,000-120,000)	2,588 (1,800-2,200)	664 (2,250-2,850)	3,418 (2,700-3,300)	1,142 (600-800)
1986	94,884 (60,000-120,000)	901 (1,800-2,200)	502 (2,250-2,850)	2,733 (2,700-3,300)	950 (600-800)
1987	124,101 (60,000-120,000)	2,039 (1,800-2,200)	1,524 (2,250-2,850)	3,105 (2,700-3,300)	1,202 (600-800)
1988	92,297 (60,000-120,000)	1,767 (1,800-2,200)	3,159 (2,250-2,850)	3,436 (2,700-3,300)	762 (600-800)
1989	92,378 (60,000-120,000)	1,645 (1,800-2,200)	2,790 (2,250-2,850)	3,286 (2,700-3,300)	1,741 (600-800)

Fall Chum and Coho Salmon a				
Year	Lower Yukon Area c	Upper Yukon Area d		
	Districts 1, 2, and 3	District 4 e	District 5	District 6
1974	230,128 (200,000)	9,213 (10,000)	24,960 (25,000)	28,363 (15,000)
1975	215,439 (200,000)	13,666 (10,000)	27,217 (25,000)	18,745 (15,000)
1976	131,313 (200,000)	1,742 (10,000)	5,387 (25,000)	19,051 (15,000)
1977	199,603 (200,000)	13,980 (10,000)	25,732 (25,000)	19,957 (15,000)
1978	191,120 (200,000)	11,020 (10,000)	21,017 (25,000)	16,325 (15,000)
1979 b	229,403 (120,000-220,000)	49,054 (10,000-40,000)	47,459 (10,000-40,000)	36,976 (7,500-22,500)
1980	204,229 (120,000-220,000)	28,008 (10,000-40,000)	41,771 (10,000-40,000)	20,678 (7,500-22,500)
1981	341,760 (120,000-220,000)	12,082 (10,000-40,000)	86,620 (10,000-40,000)	28,273 (5,500-20,500)
1982	199,880 (120,000-220,000)	3,909 (10,000-40,000)	13,593 (10,000-40,000)	14,600 (5,500-20,500)
1983	220,034 (120,000-220,000)	4,482 (10,000-40,000)	43,993 (10,000-40,000)	40,257 (5,500-20,500)
1984	155,983 (120,000-220,000)	8,720 (10,000-40,000)	24,060 (10,000-40,000)	28,252 (5,500-20,500)
1985	175,602 (120,000-220,000)	25,390 (10,000-40,000)	25,338 (10,000-40,000)	54,114 (5,500-20,500)
1986	113,452 (0-110,000)	2,045 (0-20,000)	22,053 (0-20,000)	2,333 (0-10,250)
1987	0 (0-110,000)	0 (0-20,000)	0 (0-20,000)	0 (0-10,250)
1988	79,480 (0-110,000)	15,664 (0-20,000)	16,997 (0-20,000)	35,816 (0-10,250)
1989	191,114 (0-110,000)	11,779 (0-20,000)	18,299 (0-20,000)	65,174 (0-10,250)

a Quotas or guideline harvest range shown in parenthesis.

b Beginning in 1979 quotas were replaced by guideline harvest level ranges.

c Chum salmon only; coho salmon catch not applied toward quotas or G.H.L.

d Chum and coho salmon combined (does not include roe sales); mostly fall chum.

e Beginning in 1978 quota or guideline harvest levels in effect for area upstream of Cone Point only. Subdistrict 4-A closes August 1.

Appendix Table 16. Commercial chum salmon catches by statistical area, lower Yukon Area, 1971-1989.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1971	834	87,740	24,766	34,891	40,617	8,063	67,635	17,915	282,461
1972	5,186	98,909	12,146	25,943	56,039	4,073	38,274	10,375	250,945
1973	17,259	176,119	39,583	18,608	61,969	6,413	52,770	22,706	395,427
1974	38,322	338,412	116,940	22,011	50,593	5,357	37,724	32,681	642,040
1975	28,970	257,485	103,423	12,078	41,295	5,779	99,232	28,244	576,506
1976	26,277	203,024	52,480	9,338	28,848	2,872	32,093	24,123	379,055
1977	34,312	181,459	54,082	9,872	41,799	1,083	41,026	18,777	382,410
1978	5,072	195,080	67,098	56,995	79,352	4,602	75,090	38,443	521,732
1979	1,791	115,528	38,161	43,263	92,706	46,401	93,777	47,713	479,340
1980	3,840	82,898	16,940	46,164	87,270	98,326	109,005	53,638	498,081
1981	25,569	206,200	26,220	76,591	91,722	51,660	143,747	53,283	674,992
1982	9,908	83,130	17,910	54,795	56,632	20,602	60,263	43,760	347,000
1983	42,300	122,374	40,200	75,016	65,665	42,903	121,328	65,749	575,535
1984	42,579	106,209	17,376	54,519	36,021	12,711	73,710	28,302	371,427
1985	14,290	87,872	32,162	46,932	76,155	11,866	79,846	28,311	377,434
1986	39,844	112,778	38,347	55,663	47,790	10,898	97,802	37,357	440,479
1987	34,852	51,350	22,794	15,109	21,646	7,786	45,911	23,450	222,898
1988	82,625	155,531	81,873	61,171	68,444	17,144	139,464	87,475	693,727
1989	29,129	92,723	41,456	77,153	145,519	37,945	152,195	49,387	625,507

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1971	2,255	3,144	286	427	-	6,112
1972	3,091	22,746	250	7,777	-	33,805
1973	22,207	56,193	6,181	24,111	-	108,706
1974	39,116	52,514	11,191	24,111	-	127,692
1975	20,947	98,986	11,028	19,844	-	150,805
1976	22,282	58,016	18,173	21,931	-	120,402
1977	26,158	75,281	23,789	32,445	-	157,673
1978	48,868	132,002	31,990	60,770	5,564	279,194
1979	73,509	86,020	29,988	33,069	44,294	266,880
1980	80,931	156,962	75,513	47,772	31,407	392,585
1981	76,143	215,346	88,040	78,218	49,014	506,761
1982	60,611	103,689	27,600	61,685	25,340	278,925
1983	74,985	76,494	80,631	53,099	48,528	333,737
1984	57,212	114,732	50,738	55,259	29,793	307,734
1985	42,042	98,294	28,513	24,770	34,970	228,589
1986	50,865	145,946	41,516	58,531	42,876	339,734
1987	48,734	54,459	19,157	22,988	29,538	174,876
1988	79,329	153,506	61,687	92,676	69,835	457,033
1989	58,229	174,839	63,987	73,571	71,242	441,868

District 3

Year	334-31	334-32	Total
1971	26	24	50
1972	0	1,840	1,840
1973	0	463	463
1974	1,697	576	2,273
1975	0	5,590	5,590
1976	4,450	9,602	14,052
1977	12,839	6,424	19,263
1978	20,028	18,502	38,530
1979	28,272	37,698	65,970
1980	23,646	34,655	58,301
1981	35,597	37,917	73,514
1982	3,896	6,005	9,901
1983	7,713	16,905	24,618
1984	6,876	640	7,516
1985	5,045	1,911	6,956
1986	3,235	0	3,235
1987	3,418	83	3,501
1988	13,211	2,844	16,055
1989	22,701	209	22,910

Appendix Table 17. Commercial summer chum salmon sales by statistical area, Upper Yukon Area, 1974-1989. a,b

District 4

Year	334-41		334-42		334-43		Totals	
	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,200	-	28,500	-	c	c	27,866	-
1975	105,600	-	59,500	-	c	c	165,054	-
1976	178,300	-	33,000	-	c	c	211,307	-
1977	148,700	-	20,800	-	c	c	169,541	-
1978	309,500	16,920	54,900	0	c	c	364,184	16,920
1979	136,300	35,117	29,200	200	3,900	0	169,430	35,317
1980	119,400	119,957	26,200	14,385	1,800	1,482	147,560	135,824
1981	46,000	160,757	11,800	23,677	1,900	2,598	59,718	187,032
1982	1,000	137,611	1,000	12,550	1,600	1,120	3,647	151,281
1983	3,400	130,013	3,300	17,549	0	563	6,672	148,125
1984	100	148,519	700	15,184	300	3,139	1,009	166,842
1985	5,100	222,149	1,800	19,306	5,100	5,630	12,007	247,085
1986	0	236,856	241	29,169	59	3,520	300	269,545
1987	29,314	110,977	593	9,956	84	541	29,991	121,474
1988	19,070	230,276	4,592	21,766	389	2,484	24,051	254,526
1989	14,397	270,039	2,940	9,915	1,217	3,351	18,554	283,305

District 5

Year	334-51		334-52		334-53		334-54		Totals	
	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	4,500	-	d	-	-	-	-	-	6,831	-
1975	13,000	-	0	-	-	-	-	-	12,997	-
1976	700	-	0	-	-	-	-	-	774	-
1977	1,200	-	0	-	-	-	-	-	1,274	-
1978	4,900	605	0	0	-	-	-	-	4,892	605
1979	8,600	1,009	0	0	-	-	-	-	8,608	1,009
1980	500	0	0	0	0	0	0	0	456	0
1981	1,100	0	100	49	0	0	0	0	1,236	49
1982	0	21	200	0	0	0	0	0	213	21
1983	0	242	0	269	0	1,345	0	0	42	1,856
1984	100	0	600	47	0	0	0	0	645	47
1985	0	0	700	0	0	0	0	0	700	0
1986	0	0	682	0	8	0	0	0	690	0
1987	0	0	362	44	0	0	0	0	362	44
1988	0	0	717	337	5	26	0	0	722	363
1989	0	0	112	204	1	169	41	0	154	373

District 6

Year	334-61		334-62		334-63		Totals	
	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,500	-	10,500	-	1,300	-	13,318	-
1975	5,500	-	2,300	-	6,900	-	14,782	-
1976	2,900	-	1,200	-	2,500	-	6,617	-
1977	2,300	-	1,300	-	700	-	4,317	-
1978	2,200	1,468	27,900	6,116	4,800	652	34,814	8,236
1979	300	d	14,800	d	3,500	d	18,491	3,891
1980	5,200	0	29,400	2,272	4,300	1,010	35,855	3,282
1981	4,600	0	23,500	925	4,200	1,062	32,477	1,987
1982	5,000	0	12,500	1,027	4,200	490	21,597	1,517
1983	1,900	0	21,600	18	700	0	24,309	18
1984	3,800	0	42,200	152	10,200	183	56,249	335
1985	800	0	51,100	142	15,000	1,398	66,913	1,540
1986	4,697	0	31,647	1,711	14,139	435	50,483	2,146
1987	2,167	0	6,882	349	1,561	101	10,610	450
1988	7,978	71	24,911	1,165	7,240	410	40,129	1,646
1989	16,483	61	18,960	4,277	6,672	533	42,115	4,871

a Roe in pounds and may include small amounts of chinook salmon roe.

b Majority of summer chum salmon catches rounded to nearest 100.

c Combined with statistical area 334-42.

d Information not available.

Appendix Table 18. Commercial fall chum salmon sales by statistical area, Upper Yukon Area, 1974-1989. a,b

District 4

Year	334-41		334-42		334-43		Totals	
	Number	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	-	-	9,213	-	c	c	9,213	-
1975	2,200	-	11,400	-	c	c	13,666	-
1976	400	-	1,300	-	c	c	1,742	-
1977	1,700	-	12,300	-	c	c	13,980	-
1978	-	-	11,000	1,721	c	c	10,988	1,721
1979	-	-	33,000	3,199	15,900	0	48,899	3,199
1980	-	-	15,300	1,789	12,900	2,558	27,978	4,347
1981	-	-	5,800	1,311	6,300	0	12,082	1,311
1982	-	-	1,000	20	2,900	147	3,894	167
1983	-	-	3,700	1,591	800	372	4,482	1,963
1984	-	-	3,000	1,222	4,700	993	7,625	2,215
1985	-	-	14,500	891	10,000	1,634	24,452	2,525
1986	-	-	2,045	0	0	0	2,045	0
1987	-	-	0	0	0	0	0	0
1988	-	-	10,157	703	5,505	718	15,662	1,421
1989	-	-	9,819	2,023	1,957	1,384	11,776	3,407

District 5

Year	334-51		334-52		334-53		334-54		Totals	
	Number	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	23,600	-	d	-	-	-	-	-	23,551	-
1975	27,212	-	-	-	-	-	-	-	27,212	-
1976	5,300	-	100	-	-	-	-	-	5,387	-
1977	25,600	-	0	-	-	-	-	-	25,730	-
1978	20,700	3,946	300	1,274	-	-	-	-	21,016	5,220
1979	47,400	8,097	100	0	-	-	-	-	47,459	8,097
1980	40,300	605	2,000	0	0	0	0	0	41,771	605
1981	0	178	34,000	6,760	48,600	17	4,100	0	86,620	6,955
1982	8,300	0	1,100	23	4,300	19	0	0	13,593	42
1983	3,100	0	19,800	0	18,000	0	3,100	0	43,993	0
1984	1,400	0	10,300	0	9,400	0	2,900	57	24,060	57
1985	600	0	9,300	0	13,300	0	2,200	0	25,338	0
1986	1,332	0	11,907	395	7,471	0	1,343	0	22,053	395
1987 d	0	0	0	0	0	0	0	0	0	0
1988	0	0	9,684	0	4,533	0	2,772	0	16,989	0
1989	372	60	9,937	3,327	4,987	209	2,919	393	18,215	3,989

District 6

Year	334-61		334-62		334-63		Totals	
	Number	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	9,600	-	15,400	-	1,900	-	26,884	-
1975	13,300	-	2,800	-	2,600	-	18,692	-
1976	6,400	-	7,900	-	3,600	-	17,948	-
1977	3,600	-	11,100	-	3,900	-	18,673	-
1978	4,700	1,826	8,000	1680	500	181	13,259	3,687
1979	7,100	e	21,600	e	5,500	e	34,185	7,170
1980	6,300	0	11,200	53	2,200	15	19,452	68
1981	4,900	0	18,900	2784	2,300	235	25,989	3,019
1982	700	0	4,600	596	1,500	0	6,820	596
1983	3,500	0	23,100	3009	7,500	92	34,089	3,101
1984	5,600	0	11,800	0	3,200	56	20,564	56
1985	1,500	0	34,700	0	6,200	0	42,352	0
1986	176	0	1,345	182	371	0	1,892	182
1987 d	0	0	0	0	0	0	0	0
1988	4,500	0	13,617	1,035	3,727	771	21,844	1,806
1989	14,870	173	25,650	7,050	8,570	130	49,090	7,353

a Roe in pounds and may include small amounts of coho salmon roe.

b Majority of fall chum salmon catches rounded to nearest 100.

c Combined with statistical area 334-42.

d Does not include estimates of catches involving illegal salmon and salmon roe sales.

e Information not available.

Appendix Table 19. Commercial summer chum salmon catch and effort data, Districts 1 and 2, Lower Yukon Area, 1967-1989.

Year	Duration	District 1				District 2				
		Days Fished	Boat Hours	(Catch/Boat Hour)		Duration	Days Fished	Boat Hours	(Catch/Boat Hour)	
1967	6/08-6/27	11.0	77,208	9,494	0.12	-	-	-	-	-
1968	6/06-7/03	14.0	91,380	12,995	0.14	6/13-7/02	10.5	27,600	1,407	0.05
1969	6/02-6/28	12.5	84,864	8,840	0.10	6/15-7/01	8.0	16,620	5,024	0.30
1970	6/11-7/03	10.5	58,056	87,169	1.50	6/14-7/03	9.0	15,756	17,536	1.11
1971	6/14-7/03	10.5	73,032	36,077	0.49	6/20-7/05	8.5	17,832	6,112	0.34
1972	6/08-7/01	12.5	79,236	69,658	0.88	6/15-7/01	8.5	19,296	9,040	0.47
1973 a	6/07-7/11	14.5	100,284	191,840	1.91	6/10-7/14	14.5	36,000	56,481	1.57
1974	6/03-7/13	16.5	114,624	461,025	4.02	6/05-7/16	15.5	35,316	72,281	2.05
1975	6/09-7/16	15.0	86,304	394,447	4.57	6/11-7/18	10.5	21,024	99,139	4.72
1976	6/14-7/14	12.0	90,658	272,493	3.01	6/20-7/16	11.0	32,624	99,190	3.04
1977	6/13-7/12	12.0	63,036	232,427	3.69	6/19-7/15	10.0	27,048	102,759	3.80
1978	6/08-7/15	13.5	100,008	393,785	3.94	6/08-7/14	13.5	44,376	218,196	4.92
1979	6/04-7/14	13.5	106,680	369,934	3.47	6/03-7/13	13.5	44,748	172,838	3.86
1980	6/09-7/15	12.8	89,412	391,252	4.38	6/08-7/17	12.5	48,060	308,704	6.42
1981	6/06-7/14	12.0	94,656	507,158	5.36	6/07-7/16	12.0	46,560	351,458	7.55
1982	6/14-7/13	9.5	81,240	248,950	3.06	6/16-7/16	10.0	37,920	180,321	4.76
1983	6/09-7/15	11.0	94,920	451,164	4.75	6/12-7/18	11.0	44,712	248,092	5.55
1984	6/18-7/13	8.0	67,776	291,966	4.31	6/20-7/16	8.0	32,208	234,677	7.29
1985 b	6/24-7/15	6.3	52,116	247,486	4.75	6/26-7/18	7.3	27,834	188,099	6.76
1986	6/14-7/15	8.5	66,768	381,127	5.71	6/15-7/14	7.5	33,954	288,427	8.49
1987	6/15-7/10	6.0	53,736	222,898	4.15	6/17-7/09	5.0	26,124	174,876	6.69
1988	6/09-7/15	6.8	55,692	648,198	11.64	6/12-7/14	6.8	33,456	425,172	12.71
1989	6/13-7/14	5.3	32,640	547,631	16.78	6/15-7/13	4.5	15,426	343,962	22.30

a Six inch maximum mesh size regulation during late June to early July became effective in 1973.

b Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 20. Commercial coho and fall chum salmon catch and effort data, District 1, Lower Yukon Area, 1961-1989.

Year	Duration	Days Fished a	Boat Hours	Coho		Fall Chum	
				Catch	(Catch/Boat Hour)	Catch	(Catch/Boat Hour)
1961	8/01-8/31	16	14,772	2,855	0.19	42,461	2.87
1962	8/01-9/03	21	46,950	22,926	0.49	53,116	1.13
1963	8/09-9/06	18	2,100	5,572	2.65	no purchases	
1964	8/03-8/27	17	8,346	2,446	0.29	8,347	1.00
1965	8/02-8/04	b	b	350	b	22,936	b
1966	7/25-9/10	28	41,994	19,254	0.46	69,836	1.66
1967	7/24-8/27	21	19,272	9,925	0.51	36,451	1.89
1968	7/22-8/28	22	47,232	13,153	0.28	49,857	1.06
1969	7/21-8/23	20	39,408	14,041	0.36	128,866	3.27
1970	7/20-8/26	22	56,160	12,245	0.22	200,306	3.57
1971	7/22-8/28	22	85,344	11,582	0.14	178,744	2.09
1972	7/20-8/26	22	81,726	19,655	0.24	134,752	1.65
1973	7/19-8/25	22	107,136	34,860	0.33	173,783	1.62
1974	7/18-8/14	12	41,868	13,758	0.33	137,235	3.28
1975	7/21-8/16	12	52,128	2,240	0.04	158,183	3.03
1976	7/19-8/13	11	55,026	4,084	0.07	91,091	1.66
1977	7/18-8/23	11	50,568	30,588	0.60	129,486	2.56
1978	7/17-8/29	13	56,184	16,262	0.29	127,947	2.28
1979	7/19-8/14	8	47,352	11,231	0.24	101,400	2.14
1980	7/17-8/19	7	24,216	4,819	0.20	106,829	4.41
1981	7/16-8/17	7	35,520	11,174	0.31	167,834	4.73
1982	7/19-8/13	8	40,944	15,114	0.37	91,271	2.23
1983 c	7/18-8/12	6	25,848	4,560	0.18	124,371	4.81
1984 c	7/16-8/17	6	21,240	29,472	1.39	78,751	3.71
1985 c	7/18-8/13	5	20,592	27,674	1.34	124,801	6.06
1986 d	8/04-8/22	4	13,662	24,824	1.82	59,352	4.34
1987	No Openings						
1988 e	8/08-8/30	3	9,408	36,435	3.87	45,529	4.84
1989 f	7/27-8/25	5	20,161	24,672	1.22	77,876	3.86

a One day is equivalent to 24 hours during open fishing period.

b Information unavailable.

c District was divided into a Set Net Only (24 hour) area and a Gill Net (12 hour) area.

d District was divided into a Set Net Only (24 or 12 hour) area and a Gill Net (12 or 6 hour) area.

e District was divided into a Set Net Only (12 hour) area and a Gill Net (6 hour) area.

f District was divided into a Set Net Only (16 or 12 hour) area and a Gill Net (9 or 6 hour) area.

Appendix Table 21. Fall chum salmon commercial catch data by period, District 1, Lower Yukon Area, 1978-1989.

Period Catch (Cumulative Catch) a												
Date	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
07/18	6.3 (6.3)		4.2 (4.2)					6.3 (6.3)				
07/19						16.1 (16.1)						
07/20		6.0 (6.0)			4.3 (4.3)							
07/21	5.1 (11.4)			6.0 (6.0)								
07/22			6.6 (10.8)									
07/23					27.8 (32.1)							
07/24		7.2 (13.2)		1.3 (7.3)								
07/25	52.8 (64.2)		10.4 (21.2)									
07/26												
07/27		14.8 (28.0)			4.0 (36.1)							
07/28	2.8 (67.0)			57.3 (64.6)							4.4 (4.4)	
07/29			15.3 (36.5)			3.0 (19.1)						
07/30					11.7 (47.8)							
07/31		9.7 (37.7)	1.4 (37.9)	23.2 (87.8)			18.3 (18.3)					
08/01	14.4 (81.4)											0.2 (4.5)
08/02						18.5 (37.6)		2.2 (8.5)				
08/03		17.5 (55.2)					17.1 (35.4)					
08/04	0.4 (81.8)				7.9 (55.7)							48.8 (53.3)
08/05			6.2 (44.1)			23.7 (61.3)			11.4 (11.4)			
08/06					1.2 (56.9)			15.2 (23.7)				
08/07		37.8 (93.0)	13.5 (57.6)				1.8 (37.2)					
08/08	1.4 (83.2)							7.5 (18.9)				3.8 (57.2)
08/09						44.0 (105.3)		35.8 (59.5)			32.5 (32.5)	
08/10		1.3 (94.3)			13.7 (70.6)							
08/11	1.6 (84.8)		5.2 (62.8)									2.5 (59.7)
08/12					20.7 (91.3)	19.1 (124.4)			10.5 (29.4)			
08/13				43.8 (131.6)				65.3 (124.8)				
08/14		7.1 (101.4)	1.8 (64.6)				11.8 (49.0)					
08/15	1.4 (86.2)								16.2 (45.6)			14.9 (74.7)
08/16												
08/17							10.1 (59.1)					
08/18	10.2 (96.4)			3.9 (135.5)								
08/19			42.2 (106.8)						5.8 (51.4)		0.5 (33.0)	
08/20												
08/21												
08/22	21.9 (118.3)								8.0 (59.4)			2.9 (77.6)
08/23											6.9 (39.9)	
08/24												
08/25	4.4 (122.7)											0.3 (77.9)
08/26											4.1 (44.0)	
08/27												
08/28												
08/29	5.2 (127.9)											
08/30											1.5 (45.5)	

a Period and cumulative catches in thousands of fish. Fall chum salmon run usually well underway in the lower Yukon River by July 18.

Appendix Table 22. Fall chum and coho salmon commercial catch and effort in the Set Net Only Gill Net areas, District 1, Lower Yukon Area, 1983-1989.

Set Net Area				Gill Net Area			Total		
Year	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman
Fall Chum Salmon									
1983	137	46,583	340	175	61,649	352	312	108,232	347
1984	137	34,817	254	164	24,307	148	301	59,124	196
1985	159	64,838	408	153	53,694	351	312	118,532	380
1986	122	28,449	233	160	30,903	193	282	59,352	210
1987 a									
1988	120	21,971	183	208	23,558	113	328	45,529	139
1989	103	26,865	261	219	51,011	233	322	77,876	242
Coho Salmon									
1983	137	1,021	7	175	3,536	20	312	4,557	15
1984	137	15,077	110	164	14,390	88	301	29,467	98
1985	159	12,841	81	153	14,832	97	312	27,673	89
1986	122	9,334	77	160	15,490	97	282	24,824	88
1987 a									
1988	120	13,408	112	208	23,027	111	328	36,435	111
1989	103	6,443	63	219	18,227	83	322	24,670	77
Combined									
1983	137	47,604	347	175	65,185	372	312	112,789	362
1984	137	49,894	364	164	38,697	236	301	88,591	294
1985	159	77,679	489	153	68,526	448	312	146,205	469
1986	122	37,783	310	160	46,393	290	282	84,176	298
1987 a									
1988	120	35,379	295	208	46,585	224	328	81,964	250
1989	103	33,308	323	219	69,238	316	322	102,546	318

a Season closed.

Appendix Table 23. Commercial salmon pack by species and type of processing, Yukon Area, 1960-1989. a

Year	Cases (48#)			Fresh-Frozen (round wt. in lbs.)			Cured Chinook		Cured Chum		Salmon Roe
	Chinook	Coho	Chum	Chinook	Coho	Chum	Half		Half		(lbs.)
1960	13,000			b	b	b	250	180			
1961	19,474			b	b	b	504	146			
1962	15,959	512	1,760	b	b	b	464	280			
1963	16,400	1,190		b	b	b	b	b			
1964	12,041			b	17,000	66,770	537	499			
1965	18,149			275,000	2,500	160,500	670	67			
1966	14,026	836	2,812	414,000	61,355	301,240	398	60			
1967	21,503		126	475,900	66,400	366,496	627	96			1,755
1968	19,499		816	561,690	93,154	454,409	351	170			21,000
1969	9,560	1,104	4,499	423,597	26,973 c	829,586 c	647	95	15		29,000
1970	6,431	1,002	6,413	716,600	12,900	1,725,000	447	191	51		26,300
1971	6,500	502	3,213	1,058,034	45,836	1,432,455	659	229	139		55,177
1972	7,418	1,005	6,249	1,002,395	83,960	1,495,922	497	147			85,278
1973	5,227	1,008	9,902	1,339,317	181,928	2,929,532	61	133		72	137,594
1974	6,660	603	21,074	1,062,666	58,816	3,879,300	381	56	57		208,842
1975	5,297	40	14,226	781,902	13,299	4,751,941	80	53	45	119	201,404
1976	3,921	80	11,375	1,398,779	29,778	4,256,679	93	92	72	10	226,893
1977	4,642	415	9,428	1,513,484	270,241	4,877,918	180	237	26		210,568
1978	5,711	74	9,340	1,473,354	168,241	8,639,156	222	117	7	75	261,422
1979	6,277	22	7,854	2,014,156	108,011	8,098,075	112	91		2	410,540
1980	8,764	130	15,783	3,341,262	56,295	8,781,062	29	18		37	579,927
1981	1,107	378	11,573	3,686,238	130,097	11,398,680	25	13	9	28	507,550
1982		7	751	2,790,456	246,500	4,992,877		19		1	584,053
1983		198	1,181	3,000,843	72,447	10,637,613	5	39		7	426,220
1984		5	1,768	2,426,205	590,526	5,516,532		36		16	468,244
1985				2,953,199	409,725	5,462,462		9		20 d	476,024
1986				2,012,324	299,054	5,960,857		15		28 e	502,952
1987				2,830,312	0	3,013,889		36			286,099
1988 f				1,970,879	624,734	9,111,943		10		22 g	577,748
1989 f				2,005,949	585,216	8,864,714		6		16	303,298

a Pack represents type of processing when fish were shipped out of districts.

b Information not available.

c Includes approximately 11,600 and 110,500 (round weight) of coho and chum salmon respectively, as salted fish for Japanese market.

d Additionally 13 half tierces of coho salmon were packed.

e Additionally 2 half tierces of coho salmon were packed.

f Does not include District 6 test fish sales.

g Additionally 1 half tierce of coho salmon was packed.

Appendix Table 24. Dollar value estimates of Yukon Area commercial salmon fishery, 1961-1989.

Year	Gross Value of Catch to Fishermen					Wholesale Value of Pack a	State Tax b Revenues
	Chinook	Coho	Chum	Roe	Total		
1961	420,900	1,400	14,700	-	437,000	1,292,300	37,500
1962	330,300	11,500	20,100	-	361,900	1,275,250	50,400
1963	409,500	2,800	-	-	412,300	1,500,400	42,000
1964	351,000	1,200	2,200	-	354,400	1,203,800	35,000
1965	531,400	200	10,700	-	542,300	1,412,700	42,000
1966	419,900	9,600	25,000	-	454,500	1,308,100	37,000
1967	583,700	5,500	17,200	-	606,400	1,864,800	41,700
1968	494,300	6,700	34,000	-	535,000	1,655,200	47,000
1969	415,000	8,200	96,000	-	519,200	1,976,200	40,000
1970	401,300	10,300	211,500	-	623,100	2,113,100	45,000
1971	590,100	10,000	182,900	-	783,000	2,106,600	42,000
1972	547,800	20,400	215,800	-	784,000	2,405,200	45,300
1973	561,400	46,500	609,100	-	1,217,000	4,453,900	62,800
1974	881,300	28,400	1,011,300	-	1,921,000	6,035,900	84,100
1975	589,000	3,500	1,201,400	-	1,793,900	4,939,700	87,100
1976	983,500	8,600	1,158,900	-	2,151,000	6,815,500	96,900
1977	1,928,400	143,000	1,997,300	-	4,068,700	10,499,400	151,000
1978	2,133,700	79,200	3,101,800	-	5,314,700	14,194,800	179,400
1979	3,008,000	84,400	4,527,100	-	7,619,500	19,048,800	248,600
1980	3,639,300	21,800	2,311,600	365,200	5,871,300	14,678,250	205,400
1981	4,635,500	91,900	5,323,300	601,100	10,651,800	26,629,500	322,500
1982	3,871,300	153,700	2,693,800	422,500	7,141,300	17,853,250	222,000
1983	4,198,600	29,000	2,499,800	257,400	6,984,800	17,462,000	230,000
1984	3,620,400	268,800	1,498,000	301,800	5,689,000	14,222,500	194,000
1985	4,389,100	202,600	1,952,700	487,200	7,031,600	17,579,000	227,100
1986	3,238,500	212,500	2,232,400	565,400	6,248,800	15,622,000	205,200
1987	5,521,100	0	1,372,400	270,800	7,164,300	17,910,750	232,700
1988 c	5,605,800	769,400	5,880,200	1,123,300	13,378,700	33,446,750	420,800
1989 c	5,289,900	357,300	3,194,700	1,338,200	10,180,100	25,450,150	332,000
5 Year							
Avg. 1984-88	4,474,980	290,660	2,587,140	549,700	7,902,480	19,756,200	255,960

a Based on type of processing when fish were shipped out of the area.

b Processors tax and vessel and crewmember license fees. Does not include CFEC permit fee.

c Does not include District 6 test fish sales.

Appendix Table 25. Estimated average prices paid to fishermen, Yukon Area, 1964-1989.

Year	PRICE PER FISH							
	Lower Yukon Area				Upper Yukon Area			
	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho
1964	3.75		0.25	0.50				
1965	4.50		0.35					
1966	4.50		0.35	0.50				
1967	4.50	0.35	0.35	0.50				
1968	4.64	0.50	0.50	0.50				
1969	4.60	0.50	0.50	0.55				
1970	5.00	0.61	0.61	0.84				
1971	5.34	0.64	0.64	0.82				
1972	5.90	0.75	0.75	0.92				
1973	7.45	1.18	1.18	1.27				
1974	9.00	1.36	1.58	1.75	8.67	1.00	1.00	1.00
1975	9.24	1.30	1.50	1.51	16.25	1.12	1.12	1.12
1976	11.17	1.56	1.80	1.78	12.96	1.22	1.22	1.22
1977	20.32	2.80	3.60	3.75	24.17	1.75	1.75	1.75
1978	21.60	3.20	3.62	4.20	15.38	1.54	1.97	1.97
1979	22.74	3.87	5.05	5.87	20.20	1.65	2.24	2.24
1980	23.41	1.38	1.93	2.32	13.60	1.52	2.08	1.89
1981	29.76	3.00	4.40	4.08	23.70	1.42	2.59	2.00
1982	32.43	2.80	4.27	4.59	21.83	1.28	2.10	2.41
1983	28.70	2.45	2.69	2.45	20.63	1.06	1.46	1.86
1984	30.75	1.77	2.40	3.50	18.62	1.47	1.90	1.46
1985	30.45	2.35	3.62	3.92	15.82	1.40	1.88	2.11
1986	32.93	2.62	3.53	4.47	17.53	1.34	1.12	1.26
1987	42.97	3.33			15.80	1.29		
1988	58.21	4.62	7.98	10.07	19.34	1.59	2.52	2.44
1989	55.11	2.47	3.73	4.81	13.81	1.72	2.01	2.10

Year	PRICE PER POUND							
	Lower Yukon Area				Upper Yukon Area			
	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho
1964	0.17		0.03					
1965	0.20							
1966	0.20							
1967	0.19	0.05	0.05	0.07				
1968	0.18	0.06	0.06					
1969	0.19	0.08	0.08	0.08				
1970	0.22	0.09	0.09	0.12				
1971	0.24	0.10	0.10	0.12				
1972	0.24	0.11	0.11	0.13				
1973	0.30	0.16	0.16	0.18				
1974	0.38	0.21	0.21	0.25	0.50	0.15	0.13	0.15
1975	0.42	0.20	0.20	0.21	0.92	0.17	0.14	0.17
1976	0.51	0.24	0.24	0.27	0.74	0.19	0.16	0.19
1977	0.85	0.40	0.45	0.50	1.37	0.27	0.22	0.27
1978	0.90	0.45	0.47	0.60	0.87	0.24	0.25	0.24
1979	1.09	0.52	0.68	0.80	1.00	0.25	0.29	0.25
1980	1.04	0.20	0.28	0.36	0.85	0.23	0.27	0.29
1981	1.20	0.40	0.55	0.60	1.00	0.20	0.35	0.35
1982	1.41	0.40	0.55	0.69	1.02	0.18	0.28	0.37
1983	1.40	0.34	0.34	0.35	1.08	0.16	0.19	0.31
1984	1.50	0.26	0.32	0.50	0.95	0.23	0.26	0.24
1985	1.50	0.35	0.47	0.53	0.86	0.23	0.25	0.33
1986	1.63	0.38	0.49	0.71	0.89	0.22	0.14	0.21
1987	1.98	0.49			0.79	0.19		
1988	2.97	0.66	1.01	1.38	1.04	0.23	0.32	0.37
1989	2.77	0.34	0.50	0.66	0.84	0.24	0.28	0.35

a Data unavailable.

Appendix Table 26. Average weight of salmon, commercial catch, Yukon Area, 1964-1989.

Year	Average Weight in Pounds ^a							
	Lower Yukon Area				Upper Yukon Area			
	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho
1964	22.6							
1965	23.0							
1966	23.0							
1967	24.0			7.3				
1968	26.5							
1969	23.9			6.7				
1970	22.3			7.1				
1971	22.6			6.9				
1972	24.6	6.6	7.6	7.1				
1973	24.5	6.8	7.9	7.1				
1974	23.7	6.5	7.5	7.0	17.3	6.7	7.7	6.7
1975	22.0	6.5	7.5	7.2	17.7	6.6	8.0	6.6
1976	21.9	6.5	7.5	6.6	18.4	6.4	8.0	7.5
1977	23.9	7.0	8.0	7.5	17.6	6.5	8.0	6.5
1978	24.0	7.1	7.7	7.0	20.2	6.8	7.4	6.4
1979	20.9	7.4	7.4	7.3	20.2	6.6	7.7	6.5
1980	22.5	6.9	6.9	6.4	16.0	6.6	7.7	6.5
1981	24.8	7.5	8.0	6.8	23.7	7.1	7.4	5.7
1982	23.0	7.1	7.7	6.7	21.4	7.1	7.5	6.5
1983	20.5	7.2	7.9	7.0	19.1	6.6	7.7	6.0
1984	20.5	6.8	7.5	7.0	19.6	6.4	7.3	6.1
1985	20.3	6.7	7.7	7.4	18.4	6.1	7.5	6.4
1986	20.2	6.9	7.2	6.3	19.7	6.1	8.0	6.0
1987	21.7	6.8			20.0	6.8		
1988	19.6	7.0	7.9	7.3	18.6	6.9	7.9	6.6
1989	19.9	7.2	7.5	7.3	17.9	6.8	7.4	6.0

^a Information not available for some species. Data obtained from age-length-weight samples or fish ticket entries.

Appendix Table 27. Yukon River chinook salmon subsistence catches in numbers of fish by village, 1975-1989. a

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Mouth to Anuk River															
Sheldon Pt.	108	122	302	546	91	427	163	79	1,021	802	143	592	1,173	302	165
Alakanuk	130	363	213	1,125	893	1,595	423	336	1,582	1,028	517	1,027	1,180	738	820
Emmonak	55	398	62	2,738	1,362	1,175	1,021	1,328	2,436	2,099	1,382	1,754	2,518	1,786	1,598
Kotlik	204	472	173	837	533	472	675	568	1,224	695	1,029	1,902	2,407	1,112	1,982
Subtotal	497	1,355	750	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278	4,020 g	4,888 h
Anuk River to Owl Slough															
Mt. Village	394	397	172	817	1,025	843	811	218	1,875	1,217	672	1,367	2,252	740	2,001
Pitkas Pt.-St. Marys	438	1,273	576	1,314	1,718	1,297	1,380	985	2,432	2,663	778	1,717	2,457	1,378	2,184
Pilot Station	107	502	556	1,027	804	433	399	428	2,703	1,116	896	1,452	2,593	674	1,498
Marshall	436	694	364	806	721	1,101	990	478	2,055	2,176	1,122	1,947	2,564	1,031	1,464
Subtotal	1,375	2,866	1,668	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483	9,866	3,823	7,147
Owl Slough to Bonasila R.															
Russian Mission	2,098	1,328	639	1,498	1,476	1,660	1,689	1,628	2,634	1,938	974	1,747	2,036	1,850	2,367
Holy Cross	2,792	1,492	1,920	2,404	1,787	3,123	2,312	1,731	2,276	2,456	2,368	2,505	2,625	2,593	2,379
Subtotal	4,890	2,820	2,559	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661	4,443	4,746
Lower Yukon Total	6,762	7,041	4,977	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805	12,286	16,781
Bonasila R. to Illinois Cr.															
Anvik	83	84	67	180	261	161	191	354	744	576	405	959	428	211	418
Grayling	100	117 b	149	292	391	3,664	222	294	951	879	903	1,837	1,322	1,571	1,082
Kaltag	192	57	216	127	435	694	179	344	652	487	669	1,080	1,117	1,168	1,306
Mulato	1,119	968	1,531	1,354	1,245	2,297	1,117	811	1,135	966	1,063	1,835	1,573	1,986	2,079
Koyukuk	50	437	752	518	495	699	541	493	966	1,009	194	569	609	711	1,003
Galena	1,294	435	1,155	945	1,591	1,205	570	735	1,477	1,226	1,329	1,046	1,270	1,982	1,374
Ruby-Kokrines	912	1,959	735	1,539	2,221	1,736	964	1,168	2,346	1,107	1,657	1,263	927	1,402	1,016
Subtotal	3,750	4,057	4,605	4,955	6,639	10,456	3,784	4,199	8,271	6,250	6,220	8,589	7,246	9,031	8,278
Illinois Cr. to U.S. Can. Border															
Tanana	80	1,338	858	1,851	1,604	5,711	2,517	2,230	5,547	2,682	1,248	1,672	4,021	3,537	3,008
Rampart	517	581	1,194	987	1,820	1,169	488	887	1,070	876	1,302	1,700	2,815	3,145	3,177
Stevens Village	362	643 c	1,242 c	3,178	2,194 c	3,962 c	2,387 c	3,745 c	5,203 c	4,676 c	4,628 c	4,601 c	4,363 c	4,889 c	5,312 c
Beaver	168	188	299	558	394	506	552	250	220	553	506	708	466	940	1,694
Ft. Yukon	215	1,158	1,061	2,642	1,922	2,527	2,794	1,894	1,887	3,608	2,900	3,083	3,950	2,214	4,898
Circle	16	528	304	212	1,175	769	728	969	648	545	2,259	2,233	1,614	2,034	1,785
Eagle	20	633	1,171	963	2,888	2,880	3,782	2,864	2,183	1,998	2,247	1,915	2,020	2,333	2,385
Subtotals	1,378	5,069	6,129	10,391	11,997	17,524	13,248	12,839	16,758	14,938	15,090	15,912	19,249	19,092	22,259

-Continued-

Appendix Table 27. (p. 2 of 2).

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Shageluk															
Innoko River Subtotal	-	11	-	-	62	35	10	-	-	-	-	53	47	104	32
Koyukuk River															
Huslia	23	21	50	132	146	154	61	125	459	169	144	82	182	89	177
Hughes	25	155	72	216	180	226	402	479	318	856	778	296	177	29	181
Alatna	0	0	1	7	2	20	0	6	6	2	-	-	-	27	9
Allakaket	151	231	172	239	236	197	185	268	700	373	283 d	563 d	309 d	339	429
Subtotal	199	407	295	594	564	597	648	878	1,483	1,400	1,205	941	668	484	796
Tanana River															
Minto-Manley	213	326	752	298	269	764	711	797	1,265	722	2,130	971	414	1,038	1,358
Kenai	533	864	742	807	800	771	974	1,195	966	2,556	4,919	2,093	3,151	3,846	1,188
Fairbanks	32	31	81	126	264	291	400	451	475	321	326	637	531	557 g	500 h
Subtotal	778	1,221	1,575	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096	5,441	3,046
Venetie															
Chandalar R. Subtotal	-	-	-	14	-	160	52	20	22	51	-	32	13	121	88
Upper Yukon Total	6,105	10,765	12,604	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319	34,273	34,499
Alaska Total	12,867	17,806	17,581	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124	46,559	51,280
Yukon Territory Villages															
Old Crow Porcupine R.	100	25	29	-	100	-	100	400	200	500	150	300	51	100	525
Dawson	-	500	531	421	1,200	-	1,016	20	-	-	-	-	-	-	-
Stewart River	-	-	-	-	-	-	1,000	62	-	-	-	-	-	-	-
Mayo-Stewart Crossing	-	-	61	105	-	-	-	720	-	-	-	-	-	-	-
Durwash-Kluane River	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-
Fort Selkirk	-	-	-	-	-	-	-	164	-	-	-	-	-	-	-
Pelly	-	200	265	500	-	-	-	3,142	-	-	-	-	-	-	-
Faro	-	-	-	-	-	-	3,286	-	-	-	-	-	-	-	-
Ross River	-	-	-	-	-	-	-	440	-	-	-	-	-	-	-
Minto	-	-	-	-	-	-	400	-	-	-	-	-	-	-	-
Carmacks	-	800	1,121	1,280	3,000	-	-	3,172	-	-	-	-	-	-	-
Lake Labarge-Whitehorse	-	-	-	-	-	-	3,042	7	-	-	-	-	-	-	-
Teslin-Johnson's Crossing	-	-	800	600	-	-	-	500	-	-	-	-	-	-	-
Subtotal e	3,000 f	1,525	2,807	2,906	4,200	13,046 f	9,216	8,268	5,625 f	6,610 f	6,428 f	9,267 f	6,500 f	7,560 f	8,155 f
Total	15,867	19,331	20,388	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,624	54,119	59,435

a 1961-1974 data available from 1981 Yukon Area Annual Management Report.

b Includes Shageluk catches.

c Includes catches by Fairbanks subsistence and personal use permit holders that fished in Yukon River near bridge crossing.

d Alatna combined with Allakaket.

e Combined Indian Food Fish and Domestic catch data by village obtained from annual management reports. Subtotals include revised catch data and summation of village catches may not equal subtotal.

f Catch by village not available.

g Personal use catches included (Mouth to Anuk River - 82; Fairbanks - 557).

h Personal use catches included (Mouth to Anuk River - 323; Fairbanks - 495).

Appendix Table 28. Subsistence and commercial chinook salmon catches by district and country, Yukon River drainage, 1978-1989. ^a

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
District 1												
Subsistence	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278	4,020	4,888
Commercial	59,006	75,007	90,382	99,506	74,450	95,457	74,671	90,011	53,035	76,643	57,109	59,153
Subtotal	64,252	77,886	94,051	101,788	76,761	101,720	79,295	93,082	58,310	83,921	61,129	64,041
District 2												
Subsistence	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483	9,866	3,823	7,147
Commercial	32,924	41,498	50,004	45,781	39,132	43,229	36,697	48,365	41,849	47,458	35,188	33,225
Subtotal	36,888	45,766	53,678	49,361	41,241	52,294	43,869	51,833	48,332	57,324	39,011	40,372
District 3												
Subsistence	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661	4,443	4,746
Commercial	2,916	5,018	5,240	4,023	2,609	4,106	3,039	2,588	901	2,039	1,767	1,645
Subtotal	6,818	8,281	10,023	8,024	5,968	9,016	7,433	5,930	5,153	6,700	6,210	6,391
Lower Yukon Total												
Subsistence	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805	12,286	16,781
Commercial	94,846	121,523	145,626	149,310	116,191	142,792	114,407	140,964	95,785	126,140	94,064	94,023
Total	107,958	131,933	157,752	159,173	123,970	163,030	130,597	150,845	111,795	147,945	106,350	110,804
District 4												
Subsistence ^b	5,549	7,265	11,088	4,442	5,077	9,754	7,650	7,425	9,583	7,961	9,619	9,106
Commercial	608	1,989	1,521	1,347	1,087	601	961	664	502	1,524	3,159	2,790
Subtotal	6,157	9,254	12,609	5,789	6,164	10,355	8,611	8,089	10,085	9,485	12,778	11,896
District 5												
Subsistence ^c	10,405	11,997	17,684	13,300	12,859	16,780	14,989	15,090	15,944	19,262	19,213	22,347
Commercial	3,079	3,389	4,891	6,374	5,385	3,606	3,669	3,418	2,733	3,758 ^d	3,436	3,286
Subtotal	13,484	15,386	22,575	19,674	18,244	20,386	18,658	18,508	18,677	23,020	22,649	25,633
District 6												
Subsistence	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096	5,441	3,046
Commercial	635	772	1,947	987	981	911	867	1,142	950	3,338 ^e	762	2,181
Subtotal	1,866	2,105	3,773	3,072	3,424	3,617	4,466	8,517	4,651	7,434	6,203	5,227
Upper Yukon Total												
Subsistence	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319	34,273	34,499
Commercial	4,322	6,150	8,359	8,708	7,453	5,118	5,497	5,224	4,185	8,620	7,357	8,257
Total	21,507	26,745	38,957	28,535	27,832	34,358	31,735	35,114	33,413	39,939	41,630	42,756
Alaska Totals												
Subsistence	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124	46,559	51,280
Commercial	99,168	127,673	153,985	158,018	123,644	147,910	119,904	146,188	99,970	134,760	101,421	102,280
Total	129,465	158,678	196,709	187,708	151,802	197,388	162,332	185,959	145,208	187,884	147,980	153,560
Canada												
Subsistence ^f	2,906	4,200	13,046	9,216	8,268	5,625	6,610	6,428	9,267	6,500	7,560	8,155
Commercial	2,975	6,175	9,500	8,593	8,640	13,027	9,885	12,573	10,797	10,864	13,217	9,789
Total	5,881	10,375	22,546	17,809	16,908	18,652	16,495	19,001	20,064	17,364	20,777	17,944
U.S./Canada Totals												
Subsistence	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,624	54,119	59,435
Commercial	102,143	133,848	163,485	166,611	132,284	160,937	129,789	158,761	110,767	145,624	114,638	112,069
Totals	135,346	169,053	219,255	205,517	168,710	216,040	178,827	204,960	165,272	205,248	168,757	171,504

^a Personal use catches included with subsistence. ADF&G test fishery sales included in commercial harvest.

^b Includes Innoko and Koyukuk River drainages.

^c Includes Chandalar and Black River drainages.

^d Includes illegal sales of 653 chinook salmon in District 5.

^e Includes illegal sales of 2,136 chinook salmon in District 6.

^f Combined Indian Food Fish and Domestic Fisheries harvests.

Appendix Table 29. Subsistence and commercial summer chum salmon catches by district, Yukon Area, 1978-1989. a

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
District 1												
Subsistence	30,897	16,144	15,972	11,310	18,452	24,679	28,459	24,349	38,854	30,760	29,439	53,275
Commercial	393,785	369,934	391,252	507,158	249,516	451,164	292,676	247,486	381,127	222,898	648,198	547,631
Subtotal	424,682	386,078	407,224	518,468	267,968	475,843	321,135	271,835	419,981	253,658	677,637	600,906
District 2												
Subsistence	21,684	23,276	13,681	14,218	18,442	27,396	26,996	19,795	41,496	33,134	28,787	39,703
Commercial	227,548	172,838	308,704	351,878	182,344	248,092	236,931	188,099	288,427	174,876	425,172	343,962
Subtotal	249,232	196,114	322,385	366,096	200,786	275,488	263,927	207,894	329,923	208,010	453,959	383,665
District 3												
Subsistence	1,706	2,946	3,242	4,929	5,840	4,609	7,351	3,687	5,528	4,161	5,830	3,982
Commercial	27,003	40,015	44,782	54,471	4,086	14,600	1,087	1,792	442	3,501	13,965	7,578
Subtotal	28,709	42,961	48,024	59,400	9,926	19,209	8,438	5,479	5,970	7,662	19,795	11,560
Lower Yukon Total												
Subsistence	54,287	42,366	32,895	30,457	42,734	56,684	62,806	47,831	85,878	68,055	64,056	96,960
Commercial	648,336	582,787	744,738	913,507	435,946	713,856	530,694	437,377	669,996	401,275	1,087,335	899,171
Total	702,623	625,153	777,633	943,964	478,680	770,540	593,500	485,208	755,874	469,330	1,151,391	996,131
District 4												
Subsistence b	110,059	123,740	221,201	139,572	199,985	136,045	112,965	165,383	166,072	157,406	202,185	130,137
Commercial c	381,104	204,747	181,973	241,826	115,701	166,056	214,335	321,939	359,193	109,325	383,273	429,884
Subtotal	491,163	328,487	403,174	381,398	315,686	302,101	327,300	487,322	525,265	266,731	585,458	560,021
District 5												
Subsistence e	21,028	23,878	8,594	27,308	9,791	23,943	31,535	26,996	21,833	24,850	33,436	13,297
Commercial d	4,892	8,608	456	1,236	213	42	645	700	690	362	722	154
Subtotal	25,920	32,486	9,050	28,544	10,004	23,985	32,180	27,696	22,523	25,212	34,158	13,451
District 6												
Subsistence	11,770	6,203	9,708	10,947	8,459	23,714	23,441	24,618	17,042	25,603	12,047	9,188
Commercial d	34,814	18,491	35,855	32,477	21,597	24,309	56,249	66,913	50,483	10,610	40,129	48,382
Subtotal	46,584	24,694	45,563	43,424	30,056	48,023	79,690	91,531	67,525	36,213	52,176	57,570
Total Upper Yukon												
Subsistence	142,857	153,821	239,503	177,827	218,235	183,702	167,941	216,997	204,947	207,859	247,668	152,622
Commercial	420,810	231,846	218,284	275,539	137,511	190,407	271,229	389,552	410,366	120,297	424,124	478,420
Total	563,667	385,667	457,787	453,366	355,746	374,109	439,170	606,549	615,313	328,156	671,792	631,042
Alaska Total												
Subsistence	197,144	196,187	272,398	208,284	260,969	240,386	230,747	264,828	290,825	275,914	311,724	249,582
Commercial	1,069,146	814,633	963,022	1,189,046	573,457	904,263	801,923	826,929	1,080,362	521,572	1,511,459	1,377,591
Total	1,266,290	1,010,820	1,235,420	1,397,330	834,426	1,144,649	1,032,670	1,091,757	1,371,187	797,486	1,823,183	1,627,173

a Personal use catches included with subsistence. ADF&G test fishery sales included in commercial harvest.

b Includes Koyukuk and Innoko River drainages.

c In 1986, 80.2% of the reported subsistence harvest in District 4 (excluding Koyukuk and Innoko River catches) was estimated to have been taken during commercial fishing activities. This relationship was used to adjust total estimated commercial related harvests from Appendix Table 6 for 1980-1987. Beginning in 1988, subsistence surveys documented catches based on subsistence only and commercial related fishing separately.

d Includes only fish in the round; harvest of females for commercial roe sales believed to be reported as subsistence.

e Includes Chandalar and Black River drainages.

Appendix Table 30. Subsistence and commercial fall chum salmon catches by district and country, Yukon River drainage, 1978-1989. a

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
District 1												
Subsistence	390	15,788	7,433	15,540	10,016	8,238	8,885	13,275	9,000	18,467	5,482	4,934
Commercial	127,947	109,406	106,829	167,834	97,484	124,371	78,751	129,948	59,352	0	45,529	77,876
Subtotal	128,337	125,194	114,262	183,374	107,500	132,609	87,636	143,223	68,352	18,467	51,011	82,810
District 2												
Subsistence	1,297	14,662	12,435	11,770	9,511	10,341	11,394	11,544	13,483	13,454	8,600	10,015
Commercial	51,646	94,042	83,881	154,883	96,581	85,645	70,803	40,490	51,307	0	31,861	97,906
Subtotal	52,943	106,704	96,316	166,653	106,092	95,986	82,197	52,034	64,790	13,454	40,461	107,921
District 3												
Subsistence	266	2,443	2,320	2,893	1,659	2,863	2,233	2,290	1,785	2,853	1,747	1,019
Commercial	11,527	25,955	13,519	19,043	5,815	10,018	6,429	5,164	2,793	0	2,090	15,332
Subtotal	11,793	28,398	15,839	21,936	7,474	12,881	8,662	7,454	4,578	2,853	3,837	16,351
Lower Yukon Total												
Subsistence	1,953	32,893	22,188	30,203	21,186	21,442	22,512	27,109	24,268	34,774	15,829	15,968
Commercial	191,120	229,403	204,229	341,760	199,880	220,034	155,983	175,602	113,452	0	79,480	191,114
Total	193,073	262,296	226,417	371,963	221,066	241,476	178,495	202,711	137,720	34,774	95,309	207,082
District 4												
Subsistence b	10,652	37,896	23,675	20,123	20,319	34,209	31,152	25,275	26,496	41,901	18,379	24,544
Commercial d	10,988	48,899	27,978	12,082	3,894	4,482	7,625	24,452	2,045	0	15,662	11,776
Subtotal	21,640	86,795	51,653	32,205	24,213	38,691	38,777	49,727	28,541	41,901	34,041	36,320
District 5												
Subsistence c	51,705	110,792	76,466	111,567	71,828	105,103	98,433	117,125	88,124	157,085 e	86,862	115,530
Commercial d	21,016	47,459	41,771	86,620	13,593	43,993	24,060	25,338	22,053	0	16,989	18,215
Subtotal	72,721	158,251	118,237	198,187	85,421	149,096	122,493	142,463	110,177	157,085	103,851	133,745
District 6												
Subsistence	30,557	51,766	50,328	26,632	19,564	32,174	22,726	36,963	25,155	127,903 f	38,633	60,651
Commercial d	13,259	34,185	19,452	25,989	6,820	34,089	20,564	42,352	1,892	0	48,832	66,074
Subtotal	43,816	85,951	69,780	52,621	26,384	66,263	43,290	79,315	27,047	127,903	87,465	126,725
Upper Yukon Total												
Subsistence	92,914	200,454	150,469	158,322	111,711	171,486	152,311	179,363	139,775	326,889	143,874	200,725
Commercial	45,263	130,543	89,201	124,691	24,307	82,564	52,249	92,142	25,990	0	81,483	96,065
Total	138,177	330,997	239,670	283,013	136,018	254,050	204,560	271,505	165,765	326,889	225,357	296,790
Alaska Totals												
Subsistence	94,867	233,347	172,657	188,525	132,897	192,928	174,823	206,472	164,043	361,663	159,703	216,693
Commercial	236,383	359,946	293,430	466,451	224,187	302,598	208,232	267,744	139,442	0	160,963	287,179
Total	331,250	593,293	466,087	654,976	357,084	495,526	383,055	474,216	303,485	361,663	320,666	503,872
Canada Totals												
Subsistence g	6,210	13,000	13,218	7,021	4,779	3,500	6,335	5,519	3,072	3,889	3,302	5,471
Commercial	3,356	9,084	9,000	15,260	11,312	25,990	22,932	35,746	11,464	40,591	30,263	17,549
Total	9,566	22,084	22,218	22,281	16,091	29,490	29,267	41,265	14,536	44,480	33,565	23,020
Yukon River drainage Totals												
Subsistence	101,077	246,347	185,875	195,546	137,676	196,428	181,158	211,991	167,115	365,552	163,005	222,164
Commercial	239,739	369,030	302,430	481,711	235,499	328,588	231,164	303,490	150,906	40,591	191,226	304,728
Total	340,816	615,377	488,305	677,257	373,175	525,016	412,322	515,481	318,021	406,143	354,231	526,892

a Personal use catches included with subsistence. ADF&G test fishery sales included in commercial harvest.

b Includes Innoko and Koyukuk River drainages.

c Includes Chandalar and Black River drainages.

d Includes only fish in the round; harvest of females for commercial roe sales believed to be reported as subsistence.

e Includes illegal sales involving an estimated 95,768 fall chum salmon.

f Includes illegal sales involving an estimated 119,168 fall chum salmon.

g Combined Indian Food Fish and Domestic Fisheries harvests.

Appendix Table 31. Subsistence and commercial coho salmon catches by district, Yukon Area, 1978-1989. a

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
District 1												
Subsistence	1,142	3,184	1,808	3,769	11,192	3,590	6,095	3,246	2,725	6,396	4,389	5,144
Commercial	16,460	11,369	4,829	13,129	15,115	4,595	29,472	27,676	24,824	0	36,435	24,672
Subtotal	17,602	14,553	6,637	16,898	26,307	8,185	35,567	30,922	27,549	6,396	40,824	29,816
District 2												
Subsistence	598	1,132	4,801	3,736	10,229	6,072	7,066	4,834	9,140	6,894	7,104	5,039
Commercial	5,835	2,850	2,660	7,848	14,179	2,557	43,064	17,125	21,197	0	34,776	38,522
Subtotal	6,433	3,982	7,461	11,584	24,408	8,629	50,130	21,959	30,337	6,894	41,880	43,561
District 3												
Subsistence	223	12	91	490	675	917	740	376	781	682	1,539	537
Commercial	758	0	0	419	87	0	621	171	793	0	1,419	3,988
Subtotal	981	12	91	909	762	917	1,361	547	1,574	682	2,958	4,525
Lower Yukon Total												
Subsistence	1,963	4,328	6,700	7,995	22,096	10,579	13,901	8,456	12,646	13,972	13,032	10,720
Commercial	23,053	14,219	7,489	21,396	29,381	7,152	73,157	44,972	46,814	0	72,630	67,182
Total	25,016	18,547	14,189	29,391	51,477	17,731	87,058	53,428	59,460	13,972	85,662	77,902
District 4												
Subsistence b	145	259	7,734	2,259	2,952	3,946	2,867	3,949	2,631	3,551	4,842	4,030
Commercial	32	155	30	0	15	0	1,095	938	0	0	2	3
Subtotal	177	414	7,764	2,259	2,967	3,946	3,962	4,887	2,631	3,551	4,844	4,033
District 5												
Subsistence c	970	595	561	1,713	3,428	2,448	17,467	8,098	5,870	11,900 d	19,755	7,110
Commercial	1	0	0	0	0	0	0	0	0	0	8	84
Subtotal	971	595	561	1,713	3,428	2,448	17,467	8,098	5,870	11,900	19,763	7,194
District 6												
Subsistence	4,709	4,612	5,163	9,261	7,418	6,922	14,785	11,761	13,321	55,471 e	31,509	19,650
Commercial	3,066	2,791	1,226	2,284	7,780	6,168	7,688	11,762	441	0	27,267	18,224
Subtotal	7,775	7,403	6,389	11,545	15,198	13,090	22,473	23,523	13,762	55,471	58,776	37,874
Upper Yukon Total												
Subsistence	5,824	5,466	13,458	13,233	13,798	13,316	35,119	23,808	21,822	70,922	56,106	30,790
Commercial	3,099	2,946	1,256	2,284	7,795	6,168	8,783	12,700	441	0	27,277	18,311
Total	8,923	8,412	14,714	15,517	21,593	19,484	43,902	36,508	22,263	70,922	83,383	49,101
Area Total												
Subsistence	7,787	9,794	20,158	21,228	35,894	23,895	49,020	32,264	34,468	84,894	69,138	41,510
Commercial	26,152	17,165	8,745	23,680	37,176	13,320	81,940	57,672	47,255	0	99,907	85,493
Total	33,939	26,959	28,903	44,908	73,070	37,215	130,960	89,936	81,723	84,894	169,045	127,003

a Personal use catches included with subsistence. ADF&G test fishery sales included in commercial harvest.

b Includes Innoko and Koyukuk River drainages.

c Includes Chandalar and Black River drainages.

d Includes illegal sales involving an estimated 11,840 coho salmon.

e Includes illegal sales involving an estimated 52,335 coho salmon.

Appendix Table 32. Subsistence and personal use salmon catches taken under authority of a permit, Upper Yukon Area, 1973-1989.

Upper Tanana River (upstream of Wood River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Summer Chum	Fall Chum and coho
1973	22	4	26	771	886
1974	70	b	38	1,373	1,580
1975	36	b	32	751	864
1976	110	b	31	1,314	1,512
1977	89	33	81	118	607
1978	160	126	126	2,729	1,188
1979	246	199	264	2,384	4,459
1980	315	254	282	3,729	4,059
1981	346	228	440	3,239	5,770
1982	330	209	451	2,708	4,521
1983	259	147	475	2,276	3,830
1984	308	212	321	3,177	5,134
1985	291	155	326	2,646	3,937
1986	323	211	637	4,031	4,437
1987 c	289	183	531	2,739	5,781
1988 d	210	114	557	1,715	3,538
1989 d	177	160	439	1,096	2,767

Upper Tanana River (Big Delta area) subsistence chum salmon carcass fishery

Year	No. of Permits Issued	No. Reporting Catches	Fall Chum Carcasses
1973	16	8	1,561
1974	21	b	1,974
1975	26	b	2,573
1976	36	b	3,441
1977	46	29	5,816
1978	70	43	2,517
1979	32	25	4,582
1980	57	36	4,915
1981	43	27	5,030
1982	37	13	1,690
1983	45	29	5,357
1984	31	14	2,353
1985	30	14	2,111
1986	27	19	2,276
1987 c	20	11	1,651
1988 d	22	19	2,150
1989 d	12	12	1,785

Upper Yukon River (Hess Creek to Dall River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Chum	Coho
1974	29	b	591	1,857	1,271
1975	19	b	727	778	70
1976	28	18	531	974	-
1977	38	b	467	2,567	-
1978	57	b	1,333	9,735	-
1979	55	41	2,194	12,374	-
1980	70	67	1,350	6,488	36
1981	57	24	1,095	12,034	-
1982	64	44	1,935	11,328	20
1983	68	46	2,672	15,059	-
1984	67	54	4,676	27,869	399
1985	55	42	2,618	21,832	33
1986	76	58	3,827	18,690	759
1987 c	58	47	3,492	29,734	64
1988 d	58	39	2,044	3,980	0
1989 e	71	62	3,494	6,576	397

Upper Yukon R. (22 Mi Slough to U.S./Canada border) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Chum	Coho
1979	75	60	4,063	30,475	114
1980	48	39	3,649	18,477	6
1981	71	51	4,510	38,333	-
1982	60	61	3,833	15,432	-
1983	53	52	2,831	23,708	-
1984	58	54	2,543	21,675	17
1985	59	36	2,419	19,059	2
1986	40	52	4,148	20,701	43
1987	53	60	3,634	29,864	0
1988	39	33	2,333	16,073	11
1989	59	56	1,180	7,490	1

a Some fishermen reporting catches did not have permits.

b Information not available.

c Personal use fishery established only for fall chum salmon in 1987.

d Personal use catches (fishery established for all salmon in 1988).

e Personal use and subsistence catch information.

Appendix Table 33. Chinook salmon escapement counts for selected Alaskan spawning stocks in the Yukon River drainage, 1961-1989. a

Year	Andreafsky River		Anvik River b		Nulato River	Gisasa River	Chena River		Salcha River	
	East Fork	West Fork	Aerial	Tower			River	Index g	River	Index h
1961	1,003	-	1,226	-	543 c	266 c	-	-	2,878	-
1962	675 c	762 c	-	-	-	-	61 c,d	-	937	-
1963	-	-	-	-	-	-	137 c	-	-	-
1964	867	705	-	-	-	-	-	-	450	-
1965	-	344 c	650 c	-	-	-	-	-	408	-
1966	361	303	638	-	-	-	-	-	800	-
1967	-	276 c	336 c	-	-	-	-	-	-	-
1968	380	383	310 c	-	-	-	-	-	739	-
1969	274 c	231 c	296 c	-	-	-	-	-	461 c	-
1970	665	574 c	368	-	-	-	6 c	-	1,882	-
1971	1,904	1,682	-	-	-	-	193 c,d	-	158 c	-
1972	798	582 c	-	1,198	-	-	138 c,d	-	1,193	1,034
1973	825	788	-	613	-	-	21 c	-	391	-
1974	-	285	-	471 c	78 c	161	1,016 d	959	1,857	1,620
1975	993	301	-	730	204	385	316 d	262 d	1,055	-
1976	818	643	-	1,153	648	332	531	496	1,641	1,473
1977	2,008	1,499	-	1,371	487 c	255	563	-	1,202	1,052
1978	2,487	1,062	-	1,324	920	45 c	1,726	-	3,499	3,258
1979	1,180	1,134	-	1,484	1,507	484	1,159 c	-	4,789	-
1980	958 c	1,500	1,192	-	1,323 c	951	2,541	-	6,757	6,126
1981	2,146 c	231 c	577 c	-	791 c	-	600 c	-	1,237 c	1,121
1982	1,274	851	-	-	-	421	2,073	-	2,534	2,346
1983	-	-	376 c	-	1,006	572	2,553	2,336	1,961	1,803
1984	1,573 c	1,993	574 c	-	-	-	501	494	1,031	906
1985	1,617	2,248	720	-	2,780	735	2,553	2,262	2,035	1,860
1986	1,954	3,158	918	-	2,974	1,346	2,031	1,935	3,368	-
1987	1,608	3,281	879	-	1,638	731	1,312	1,209 c	1,898	1,671
1988	1,020	1,448	1,449	-	1,775	797	1,966	1,760	2,761	2,553
1989	1,399	1,089	212 c	-	-	-	1,280	1,185	2,333	2,136
E.O. e	1,600	1,000	500 f	-	1,000	650		1,700		3,500

a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.

b From 1961-1970, aerial survey count data are from various segments of the mainstem Anvik River.

From 1971-1979, mainstem aerial survey counts below the tower were added to tower counts.

From 1980-present, aerial survey counts are from the mainstem Anvik River between the Yellow River and McDonald Creek.

c Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.

d Boat Survey.

e Interim escapement objective.

f Interim escapement objective for the mainstem Anvik River between the Yellow River and McDonald Creek.

g Chena River index area for assessing escapement objectives is from Moose Creek Dam to Middle Fork River.

h Salcha River index area for assessing escapement objectives is from TAPS crossing to Caribou Creek.

Appendix Table 34. Chinook salmon escapement counts for selected Canadian spawning stocks in the Yukon River drainage, 1961-1989. a

Year	Tincup Creek	Tatchun River b	Little Salmon River	Big Salmon River d	Nisutlin River e	Wolf River f	Whitehorse Fishway g	Mainstem Tagging Estimate h
1961	-	-	-	-	-	-	1,068	-
1962	-	-	-	-	-	-	1,500	-
1963	-	-	-	-	-	-	483	-
1964	-	-	-	-	-	-	595	-
1965	-	-	-	-	-	-	903	-
1966	-	7 c	-	-	-	-	563	-
1967	-	-	-	-	-	-	533	-
1968	-	-	173 c	857 c	407 c	-	414	-
1969	-	-	120	286	105	-	334	-
1970	-	100	-	670	615	71 c	625	-
1971	-	130	275	275	650	750	856	-
1972	-	80	126	415	237	13	391	-
1973	100	99	27 c	75 c	36 c	-	224	-
1974	-	192	-	70 c	48 c	-	273	-
1975	-	175	-	153 c	249	40 c	313	-
1976	-	52	-	86 c	102	-	121	-
1977	-	150	408	316 c	77	-	277	-
1978	-	200	330	524	375	-	725	-
1979	-	150	489 c	632	713	183 c	1,184	-
1980	-	222	286 c	1,436	975	377	1,383	-
1981	-	133	670	2,411	1,626	395	1,555	-
1982	-	73	403	758	578	104	473	19,790
1983	100	264	101 c	540	701	95	905	28,989
1984	150	161	434	1,044	832	124	1,042	27,616 i
1985	210	190	255	801	409	110	508	10,730
1986	228	155	54 c	745	459 c	109	557	16,415
1987	100	159	468	891	183	35	327	13,210
1988	204	130	368	765	267	66	405	23,118
1989	88	100	862	1,662	695	146	549	25,201

E.O. j

33,000-43,000

- a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.
- b All foot surveys except 1978 (boat survey) and 1986 (aerial survey).
- c Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
- d For 1968, 1970, and 1971 counts are from mainstem Big Salmon River. For all other years counts are from the mainstem Big Salmon River between Big Salmon Lake and the vicinity of Souch Creek.
- e One Hundred Mile Creek to Sidney Creek.
- f Wolf Lake to Red River.
- g Includes 50, 90, and 292 fin-clipped hatchery-origin salmon in 1988, 1989, and 1990, respectively.
- h Estimated total spawning escapement excluding Porcupine River (estimated border escapement minus the Canadian catch).
- i Estimate derived by dividing the 1984 5-area (Whitehorse Fishway, Big Salmon, Nisutlin, Wolf, Tatchun) by the average proportion of the 5-area index count to the estimated spawning escapements from the DFO tagging study for years 1982, 1983, and 1985-1989.
- j Interim escapement objective.

Appendix Table 35. Summer chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1973-1989. a

Andreafsky River										
Year	East Fork		West Fork		Anvik River	Nulato River	Gisasa River	Hogatza River	Chena River	Salcha River
	Aerial	Sonar or Tower								
1973	10,149 b	-	51,835	86,665 b,e	-	-	-	-	-	-
1974	3,215 b	-	33,578	201,277 e	51,160	-	-	-	-	3,510
1975	223,485	-	235,954	845,485 e	138,495	-	22,355	-	-	7,573
1976	105,347	-	118,420	406,166 e	40,001 b	-	20,744	-	-	6,474
1977	112,722	-	63,120	262,854 e	69,660	-	10,734	-	-	677 b
1978	127,050	-	57,321	251,339 e	54,480	9,280 b	5,102	1,609	5,405	
1979	66,471	-	43,391	280,537 c	37,104	10,962	14,221	1,025 b	3,060	
1980	36,823 b	-	115,457	492,676 c	14,946 b	10,388	19,786	338	4,140	
1981	81,555	147,312 c	-	1,479,582 c	14,348 b	-	-	3,500	8,500	
1982	7,501 b	181,352 c	7,267 b	444,581 c	-	334 b	4,984 b	1,509	3,756	
1983	-	110,608 c	-	362,912 c	21,012 b	2,356 b	28,141	1,097	716 b	
1984	95,200 b	70,125 c	238,565	891,028 c	-	-	-	1,861	9,810	
1985	66,146	-	52,750	1,080,243 c	29,838	13,232	22,566	1,005	3,178	
1986	83,931	167,614 d	99,373	1,189,602 c	64,265	12,114	-	1,509	8,028	
1987	6,687 b	45,221 d	35,535	455,876 c	11,257	2,123	5,669 b	333	3,657	
1988	43,056	68,937 d	45,432	1,125,449 c	42,083	9,284	6,890	432	2,889 b	
1989	21,460 b	-	-	636,906 c	-	-	-	714 b	1,574 b	
E.O. f	109,000	-	116,000	487,000	-	-	17,000 g	-	3,500	

a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.

b Incomplete survey and/or poor survey timing or conditions resulted in minimal or inaccurate count.

c Sonar count.

d Tower count.

e Tower count plus aerial survey count below tower.

f Interim escapement objective.

g Interim escapement objective includes Clear Creek (8,000) and Caribou Creek (9,000).

Appendix Table 36. Fall chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1974-1989.

Year	Delta River a	Toklat River b	Chandalar River c	Sheenjek River d	Fishing Branch River e	Canada Mainstem Tagging Estimate f
1974	5,915	43,484	-	89,966	32,525 g	-
1975	3,734 h	90,984	-	173,371	353,282 g	-
1976	6,312 h	53,882	-	26,354	36,584	-
1977	16,876 h	36,462	-	45,544	88,400	-
1978	11,136	37,057	-	32,449	40,800	-
1979	8,355	179,627	-	91,372	119,898	-
1980	5,137	26,373	-	28,933	55,268	-
1981	23,508	15,775	-	74,560	57,386 i	-
1982	4,235	3,601	-	31,421 c	15,901	31,958
1983	7,705	20,807	-	49,392 c	27,200	90,875
1984	12,411	16,511	-	27,130 c	15,150	56,633 j
1985	17,276 h	22,805	-	152,768 c	56,100 g	62,010
1986	6,703 h	18,903	59,313	83,197 c	31,173 g	87,990
1987	21,180	22,141	52,416	140,086 c	48,956 g	80,776
1988	18,024	13,324	33,619	41,073 c	23,597 g	36,786
1989	21,342 h	30,447	69,161	101,748 c	43,834 g	35,750
E.O. k	11,000	33,000	-	62,000	50,000 -120,000	-

- a Total escapement estimates made from migratory time density curve (see Barton 1986), unless otherwise indicated.
- b Total escapement estimates using Delta River migratory time density curve and percentage of live salmon present by survey date in the upper Toklat River area.
- c Sonar estimate.
- d Total escapement estimates using sonar to aerial survey expansion factor of 2.221, unless otherwise indicated.
- e Total escapement estimates using weir to aerial survey expansion factor of 2.72, unless otherwise indicated.
- f Estimated total spawning estimates excluding Porcupine-Fishing Branch Rivers (estimated border escapement minus Canadian removal).
- g Weir estimate.
- h Population estimate from replicate foot surveys and stream life data.
- i Initial aerial survey count was doubled before applying the weir/aerial expansion factor of 2.72 since only half of the spawning area was surveyed.
- j Escapement estimate based on mark-recapture program unavailable. Estimate based on assumed average exploitation rate.
- k Interim escapement objective.

Appendix Table 37. Coho salmon escapement counts for selected spawning areas in the Yukon River drainage, 1972-1989. a

Year	Nenana River Drainage				Delta	Clearwater	Richardson
	Lost Slough	Clear Creek	Wood Creek b	17 Mile Slough	Clearwater River d,e	Lake and Outlet	Clearwater River
1972	-	-	-	-	632	417	454 g
1973	-	-	-	-	3,322	551 d	375 d
1974	1,388	-	-	27	3,954	560	652 d
1975	943	-	-	956	5,100	1,575 d,e	4 g
1976	118	13	-	281	1,920	1,500 d,e	80 g
1977	524	-	310 c	1,167	4,793	730 d,e	327
1978	350	-	300 c	466	4,798	570 d,e	-
1979	227	-	-	1,987	8,970	1,015 d,e	372
1980	499	-	1,603 c	592	3,946	1,545 d,e	611
1981	274	-	849 h	1,005	8,563 f	459 g	550
1982	-	-	1,436 h	-	8,365 f	-	-
1983	766	-	1,044 h	103	8,019 f	253	88
1984	2,677	2,600 b,e	8,805 h	-	11,061	1,368	428
1985	1,584	-	3,775 h	2,081	5,358	750	-
1986	794	605 b,e	1,664 h	218 b,e	10,857	3,577	146 g
1987	2,511	-	2,450 h	3,802	22,300	4,225 d,e	-
1988	348	-	2,046 h	-	21,600	825 d,e	-
1989	-	-	412 h	824 g	11,000	1,600 d,e	483

a Only peak counts presented. Survey rating is fair to good, unless otherwise noted.

b Surveyed by F.R.E.D.

c Foot survey.

d Surveyed by Sport Fish Division.

e Boat survey.

f Population estimate.

g Poor survey.

h Weir count.

Appendix Table 38. Percent of catch by age for salmon in Yukon River commercial and subsistence harvests, 1982-1989. a

Species	Year	Sample Size	Age						Total
			3	4	5	6	7	8	
Chinook Salmon	1982	3,795	0.2	6.8	18.5	58.3	15.9	0.3	100.0
	1983	3,801	0.0	6.6	21.0	62.9	9.4	0.0	100.0
	1984	3,700	0.0	3.7	27.0	56.0	13.1	0.1	100.0
	1985	4,567	0.1	5.7	13.2	69.4	11.3	0.3	100.0
	1986	5,785	0.3	3.9	27.2	42.8	25.1	0.6	100.0
	1987	5,300	0.0	4.2	8.4	72.5	14.5	0.3	100.0
	1988	5,108	0.1	14.8	22.8	31.5	29.4	1.4	100.0
	1989	4,310	0.3	5.8	32.2	51.9	9.0	0.8	100.0
Summer Chum Salmon	1982	3,419	2.0	61.2	34.4	2.4			100.0
	1983	4,110	1.0	53.8	44.4	0.8			100.0
	1984	2,722	2.0	73.7	23.9	0.5			100.0
	1985	2,472	1.4	68.6	29.2	0.8			100.0
	1986	3,473	0.1	29.1	69.8	1.0			100.0
	1987	2,184	0.4	60.8	31.8	6.9			100.0
	1988	5,112	0.0	70.1	29.1	0.8			100.0
	1989	4,482	0.5	41.2	57.6	0.7			100.0
Fall Chum Salmon	1982	2,918	6.5	58.6	34.5	0.3			100.0
	1983	1,735	0.7	91.4	8.0	0.0			100.0
	1984	1,902	6.6	55.6	37.5	0.4			100.0
	1985	2,801	5.2	83.4	11.0	0.4			100.0
	1986	1,715	7.4	89.6	2.5	0.5			100.0
	1987	1,513	5.0	77.1	17.5	0.4			100.0
	1988	4,030	4.1	45.7	46.6	3.5			99.9
	1989	2,792	1.1	85.8	12.8	0.3			100.0
Coho Salmon	1982	320	4.1	87.3	8.6				100.0
	1983	121	4.1	91.7	4.1				100.0
	1984	619	12.9	73.7	13.4				100.0
	1985	462	14.1	76.3	9.6				100.0
	1986	491	2.2	88.6	9.2				100.0
	1987	0							0.0
	1988	1,091	12.2	85.5	2.3				100.0
	1989	749	19.2	76.3	4.5				100.0

a Age composition estimated from samples collected from each gear type, by district and fishery, or from samples from adjacent fisheries of the same gear type. Fisheries for which no appropriate samples were available were not apportioned to age.

Appendix Table 39. Associated environmental and salmon catch data, Yukon River, 1961-1989.

Year	Average Nome April Air Temp. (F)	Tanana River Nenana Ice Breakup	Iceout Yukon Delta Area	First Chinook Caught Delta Area b	First Chinook Caught Kuskokwim River b	First Chinook Caught Dist. 1 Comm. Fishery	First Summer Chum Caught Delta Area b	First Summer Chum Caught Dist. 1 Comm. Fishery
1961	18	5/05	a	6/05	a	6/05	a	-
1962	18	5/12	6/10	6/07 c	a	6/11	a	-
1963	18	5/05	5/29	a	a	6/03	a	-
1964	13	5/20	>6/12	a	a	6/15	a	-
1965	20	5/07	6/01	6/06	5/31	6/07	a	-
1966	15	5/08	6/06	6/09	5/27 g	6/10	a	-
1967	23	5/04	a	5/20	5/20	6/02	5/30	6/09
1968	14	5/08	a	a	5/26	6/03	6/05	6/07
1969	22	4/28	5/25	5/26	5/23	6/02	6/02	6/02
1970	15	5/04	late May	6/06	5/21	6/06	6/05	6/11
1971	13	5/08	6/05	6/11	6/06	6/11	6/15	6/15
1972	12	5/10	6/03	6/09	6/05	6/09	6/11	6/10
1973	18	5/04	6/01	5/30 d	5/27	6/05	6/05	6/07
1974	21	5/06	late May	5/27	5/23	6/03	6/01	6/03
1975	13	5/10	6/01	6/01	5/26	6/09	6/13	6/13
1976	10	5/02	6/01	6/12	6/01	6/14	6/13	6/14
1977	9	5/06	6/01	6/09	5/31	6/11	6/11	6/13
1978	25	4/30	5/20	5/26	5/18	6/08	5/26	6/08
1979	26	4/30	5/20	5/24	5/16	6/04	5/28	6/04
1980	24	4/29	5/19	5/27 e	5/17	6/09	5/31	6/09
1981	24	4/30	5/18	5/25	5/22	6/05	5/28	6/05
1982	12	5/10	6/02	6/06	6/01	6/14	6/06	6/14
1983	25	4/29	5/21	5/25	5/23	6/09	5/30	6/09
1984	12	5/09	6/01	6/02 f	5/25	6/18	6/08	6/08
1985	1	5/11	6/05	6/14	6/03	6/24	6/16	6/24
1986	12	5/08	6/01	6/06	5/29	6/14 h	6/07	6/14
1987	19	5/05	5/31	5/31	5/24	6/15	6/04	6/15
1988	23	4/27	5/20	5/27	5/16	6/09 h	5/27	6/09
1989	25	5/01	5/31	5/29 i	5/25	6/13 h	6/03	6/13

a Information not available.

b Subsistence or test net fishery.

c Caught 6/09 Mt. Village, back calculated arrival date to mouth.

d Caught 6/03 Pilot Station, back calculated arrival date to mouth.

e Caught 5/23 Marshall, back calculated arrival date to mouth.

f Caught 6/05 Pitkas Point, back calculated arrival date to mouth.

g Caught 6/01 Kalskag, back calculated arrival date to mouth.

h Special six inch maximum mesh size fishing period.

i Caught 6/01 St. Marys, back calculated arrival date to mouth.

Appendix Table 40. Total catch and estimated catch of Western Alaska (including Canadian Yukon) chinook salmon (in thousands of fish) taken in Japanese high seas salmon gill net fisheries and total catch of chinook salmon taken in foreign and joint-venture trawl fisheries, 1964-1989.

Year	Japanese Mothership Gillnet		Japanese Landbased Driftnet		Japanese Total Gillnet		Bering Sea-Aleutian Area Trawl			Gulf of Alaska Trawl		
	Western Alaska Origin	Total	Western Alaska Origin	Total	Western Alaska Origin	Total	Foreign	Joint Venture	Total	Foreign	Joint Venture	Total
1964	179	410	40	208	219	618						
1965	106	185	20	102	126	287						
1966	108	208	22	118	130	326						
1967	71	128	22	115	93	243						
1968	244	362	18	97	262	459						
1969	367	554	17	88	384	642						
1970	312	437	28	148	340	585						
1971	132	206	27	139	159	345						
1972	189	261	20	107	209	368						
1973	56	119	31	165	87	284						
1974	208	361	36	188	244	549						
1975	108	162	20	137	128	299						
1976	117	285	42	201	159	486						
1977	55	93	31	146	86	239				4.8		4.8
1978	36	105	63	210	99	315	39.1		39.1	a		
1979	69	126	45	160	114	286	100.4		100.4	16.9	1.0	17.9
1980	416	704	22	160	438	864	113.2	1.9	115.1	31.6	0.2	31.8
1981	30	88	55	190	85	278	36.7	0.3	37.0	28.6	0.0	28.6
1982	45	107	41	165	86	272	13.9	1.7	15.6	a	3.5	5.9
1983	31	87	44	178	75	265	9.8	0.5	10.3	5.9	9.4	9.4
1984	36	82	21	92	57	174	a	a	b	11.1	63.2	74.3
1985	25	66	22	101	47	167	b	b	b	0.3	13.6	13.6
1986	24	60	20	77	44	137	0.3	4.0 c	4.3	d	18.0	18.0
1987	20	39	b	77	b	116	b	b	b	d	b	b
1988	23	26	b	47	b	73	d	b	b	d	b	b
1989	b	16	b	51	b	67	d	b	b	d	d	d

a. Species composition unknown.

b. Information not available.

c. Longline harvest only, no trawling conducted in 1986.

d. No fishing.

Appendix Table 41. Commercial herring fishing data, Cape Romanzof District, 1980-1989.

	1980	1981	1982	1983 a	1984	1985	1986	1987	1988	1989
Catch (st)	611	720	657	816	1,185	1,299	1,865	1,342	1,119	926
Hours Fished	326	120	180	144	90	60	42	8	11	13
Percent Roe Recovery	9.8	8.0	9.3	9.0	8.6	8.3	9.2	8.9	9.1	9.3
Estimated Value (\$ millions)	0.13	0.21	0.22	0.37	0.31	0.55	1.14	1.00	1.02	0.49
Number of Buyers	2	4	2	3	3	2	5	9	6	6
Number of Fishermen	69	111	75	63	66	73	97	157	113	115
Number of Boats	54	82	50	57	59	69	90	152	108	110
% Effort by Local Fishermen	70	81	85	92	98.5	91	84	53	63	87
% Harvest by Local Fishermen	40	60	84	88	99.8	94	70	33	60	82
Biomass Estimate b	3,000	4,900	4,900	5,500	6,100	7,000	7,500	7,200	6,600	4,400
Exploitation Rate	20.4	14.7	13.4	14.8	19.4	18.6	24.9	18.6	17.0	21.0

a Exclusive Use Regulation into effect.

b Biomass estimates from 1980 to 1986 were qualitative estimates of herring abundance to describe abundance trends. Biomass estimate for 1987 was by aerial survey.

Appendix Table 42. Subsistence herring harvest (st) and effort data, Cape Romanzof, 1975-1989. a

Year	Scammon Bay	Chevak	Hooper Bay	Total	Number of Fishing Families
1975	-	-	3	3	34
1976	1	1	3	5	41
1977	-	<1	2	<3	30
1978	1	-	4	5	29
1979	6	2	3	11	84
1980	3	4	4	11	61
1981	8	2	4	14	46
1982	4	2	5	11	43
1983	3	1	5	9	37
1984	4	3	4	11	47
1985	2	2	4	8	44
1986	2	1	4	7	41
1987	1	1	1	3	39
1988	2	2	3	7	30
1989	1	<1	1	2	19

a Subsistence survey results are believed to accurately reflect harvest trends, however, reported catches reflect minimum figures since all fishermen cannot be contacted.

Appendix Table 43. Colville River commercial whitefish catches, 1964-1989.

Year	Broad Whitefish	Humpback Whitefish	Arctic Cisco ("kaktok")	Least Cisco ("herring")
1964	2,951 a		16,000	9,000
1965	3,000 a		50,000	
1966	2,500 a		40,000	
1967	data not available			
1968	3,130		42,055	18,180
1969	data not available			
1970	2,080 a		19,602	25,930
1971	3,815	132	38,016	22,713
1972	3,850	1,497	37,333	13,283
1973	2,161		71,569	25,188
1974	3,117	2,316	35,601	13,813
1975	2,201	1,946	28,291	20,778
1976	2,172	1,815	31,659	34,620
1977	443	1,431	31,796	14,961
1978 b	20 c	1,102	17,292	21,589
1979	c	1,831	8,684	24,984
1980	c	4,231	14,657	31,459
1981	1,035	469	38,206	16,584
1982	1,662	201	15,067 d	25,746 d
1983	c	408 c	18,162	35,322
1984	789	179	27,686	13,076
1985	401	191	23,679	17,595
1986 e	0	18	29,895	9,444
1987 e	5	1,989	24,769	10,922
1988	429	6,733	10,287	23,910
1989	71	6,575	17,877	23,303

a Includes small numbers of humpback whitefish.

b Also reported taken were 1 chinook, 2 sockeye, 9 chum, and 118 pink salmon.

c No fishing effort during June or July.

d No fishing effort during November or December.

e No fishing effort during July or December.

Average weights: Broad whitefish 5.1 lbs.

Least cisco 0.9 lbs.

Arctic cisco 1.0 lbs.

Appendix Table 44. Commercial freshwater fishery catches, Upper Yukon Area, 1971-1989.

Year	Healy Lake		Lake Minichumina		Tanana River				Yukon River			
	Whitefish		Whitefish		Burbot		Whitefish		Burbot		Whitefish	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1971			3,277	9,831								
1972	2,605	3,950	718	2,154								
1973	2,187	3,915	1,697	5,037								
1974	1,885	3,390	854	2,562								
1975	1,357	2,375										
1976	1,440	2,625										
1977	-	-										
1978	-	-										
1979	1,336	2,306										
1980	data unavailable											
1981	no effort											
1982	no effort											
1983	no effort											
1984	no effort											
1985	no effort											
1986	no effort											
1987	no effort											
1988	no effort											
1989	no effort											

Appendix Table 45. Commercial freshwater fishery catches, Lower Yukon Area, 1978-1989.

Year	Sheefish		Whitefish		Blackfish	Burbot		Pike	Lamprey
	Number	Pounds	Number	Pounds	Pounds	Number	Pounds	Pounds	Pounds
1978	-	-	19	87	-	-	-	-	-
1979	5	39	23	55	-	-	-	-	-
1980	283	2,265	78	250	293	-	-	-	-
1981	299	2,812	779	2,875	-	-	-	9	-
1982	754	6,161	1,633	6,214	-	102	482	-	-
1983	395	2,692	163	648	-	-	-	-	-
1984	94	762	794	2,362	-	-	-	-	-
1985	358	3,081	1,514	4,586	-	-	-	-	-
1986	-	-	1,533	5,845	-	-	-	-	80
1987	-	-	2,144	7,564	-	-	-	-	-
1988	-	-	696	2,171	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-

Attachment 1. List of Lower Yukon Area Emergency Orders, 1989

<u>E.O. Number</u>	<u>Date</u>	<u>Action Taken</u>	<u>Comments</u>
3-LY-01-89	May 26	Established the first Cape Romanzof District commercial herring fishing period beginning 7:30 p.m. May 26 until 11:30 p.m. May 26. Additionally, restricted gear to 50 fathoms per vessel.	Beach party samples and spawning ground surveys indicated an abundance of herring of high roe quality. Due to 100-110 fishing vessels on grounds and increased efficiency of fleet in recent years, gear restriction was warranted.
3-LY-02-89	May 27	Established the second Cape Romanzof District commercial herring fishing period beginning 9:00 p.m. May 27 until 12:00 midnight May 27. Additionally, restricted gear to 50 fathoms per vessel.	Test and commercial beach party samples indicated a large abundance of herring with the majority of fish ripe and good quality. Due to commercial catch rates during first fishing period, gear restriction warranted.
3-LY-03-89	May 29	Established the third Cape Romanzof District commercial herring fishing period beginning 10:00 p.m. May 29 until 1:00 a.m. May 30. Additionally, restricted gear to 50 fathoms per vessel.	Beach party samples and spawning ground surveys indicated an abundance of herring of high roe quality. Due to increased efficiency of fleet in recent years, gear restriction was warranted.
3-LY-04-89	May 30	Established the fourth and final Cape Romanzof District commercial herring fishing period beginning 10:00 p.m. May 30 until 1:00 a.m. May 31. Additionally, restricted gear to 50 fathoms per vessel.	Test and commercial beach party samples indicated a large abundance of herring with the majority of fish ripe and good quality, gear restriction warranted.

<u>E.O. Number</u>	<u>Date</u>	<u>Action Taken</u>	<u>Comments</u>
3-LY-05-89	June 13	Opened the commercial salmon season effective 6:00 p.m. June 13 in District 1, and 6:00 a.m. June 15 in District 2. Established single 12 hour fishing periods in Districts 1 and 2, restricted to use of gill nets of six inch or smaller mesh size.	Test fish and subsistence catch rates and sonar enumeration indicated the chum salmon run was of early run timing and of at least average magnitude.
3-LY-06-89	June 13	Prohibited commercial fishermen from taking salmon for subsistence purposes by gill nets with mesh size larger than six inch maximum mesh size during commercial fishing periods restricted to six inch or smaller mesh size; in District 1 beginning 6:00 p.m. June 13 and in District 2 beginning 6:00 a.m. June 15.	Action taken to prevent chinook salmon harvested under guise of subsistence from entering the commercial market.
3-LY-07-89	June 15	Established two 12 hour fishing periods per week in District 1 beginning at 6:00 p.m. Thursday, June 15 and in District 2 beginning 6:00 p.m. Sunday, June 18. Weekly fishing periods 6:00 p.m. Thursday until 6:00 a.m. Friday and 6:00 p.m. Monday until 6:00 a.m. Tuesday in District 1 and 6:00 p.m. Sunday until 6:00 a.m. Monday and 6:00 p.m. Wednesday until 6:00 a.m. Thursday in District 2.	Approximately 7-10 days of increasing chinook salmon subsistence and test fishing catches warrant unrestricted mesh size fishing periods.
3-LY-08-89	June 16	Established special 24-hour subsistence fishing periods every other weekend during the commercial salmon fishing season in Districts 1 and 2. Specifically this emergency order opened subsistence fishing from 6:00 p.m. June	Special subsistence fishing periods established by emergency order as stipulated by regulation to provide for increased subsistence fishing opportunity.

<u>E.O. Number</u>	<u>Date</u>	<u>Action Taken</u>	<u>Comments</u>
		17 until 6:00 p.m. June 18 and from 6:00 p.m. July 1 until 6:00 p.m. July 2 in District 1. In District 2, subsistence fishing opened from 6:00 p.m. June 16 until 6:00 p.m. June 17 and from 6:00 p.m. June 30 until 6:00 p.m. July 1.	
3-LY-09-89	June 21	Opened the commercial salmon unrestricted mesh size fishing season effective 6:00 p.m. June 21 in District 3 of the Yukon area. Also established two 12 hour fishing periods a week in District 3 (concurrent openings with District 2).	Test fish and subsistence catch data indicated that chinook salmon were present in harvestable numbers in the lower 300 miles of the river.
3-LY-10-89	June 23	Established special 24-hour subsistence only fishing periods every other weekend during the commercial salmon fishery in District 3. Specifically this emergency order opened subsistence fishing from 6:00 p.m. June 23 until 6:00 June 24 and from 6:00 p.m. July 7 until 6:00 p.m. July 8.	Special subsistence only fishing periods established by emergency order in response to reduced subsistence fishing opportunity due to reduction in allowable commercial fishing time, and in response to reports from subsistence fishermen which indicated they needed more fishing opportunity.
3-LY-11-89	June 22	Amended a single scheduled fishing period in District 1 as established by E.O. 3-LY-07-89 by reducing fishing time 6 hours, so that fishing occurred from 6:00 p.m. Thursday until 12:00 midnight Thursday June 22.	Chinook salmon catch was approaching 60,000 combined for Districts 1 and 2. Reduced fishing time was warranted in order to keep the total season harvest at approximately 90,000.
3-LY-12-89	June 25	Amended a single scheduled fishing period in District 2 as established by E.O. 3-LY-7-89 by reducing fishing time	Chinook salmon catch was approaching 60,000 combined for Districts 1 and 2. Reduced

<u>E.O. Number</u>	<u>Date</u>	<u>Action Taken</u>	<u>Comments</u>
3-LY-13-89	June 24	Established a special chum salmon directed 12 hour commercial fishing period from 6:00 p.m. Saturday, June 24 until 6:00 a.m. Sunday, June 25 with gill nets restricted to six inch mesh or smaller mesh size.	Chum salmon return appeared to be of average timing and at least average in abundance according to test fishing and sonar data.
3-LY-14-89	June 26	Established gill net mesh size restriction of six inch or smaller mesh size for taking of salmon for commercial purposes beginning June 26 in Districts 1 and 2. Additionally, this emergency order established a special chum salmon directed 12 hour commercial fishing period from 6:00 a.m. Tuesday until 6:00 p.m. Tuesday, June 27 in District 2.	A switch over to gill nets of six inch maximum mesh size directed the harvest toward summer chum salmon. Additional harvest of chinook salmon was expected in small mesh gear. Test fishing data indicated a large abundance of summer chum salmon entering the river.
3-LY-15-89	June 27	Amended E.O. 3-LY-07-89 by voiding a single commercial fishing period in District 2 scheduled to occur from 6:00 p.m. Wednesday June 28 until 6:00 a.m. Thursday June 29.	Recent large harvests of an estimated 250,000 to 300,000 summer chum salmon warranted voiding this period in order to re-assess run strength.
3-LY-16-89	June 29	Established a chum salmon directed 6 hour commercial fishing period from 6:00 a.m. Thursday until 12:00 noon Thursday, June 29 in District 2.	Lower Yukon test fishing catches indicated fairly strong numbers of summer chum entering the river and the sonar count was increasing rapidly as of June 28, indicating a harvestable surplus.
3-LY-17-89	June 30	Amended E.O. 3-LY-10-89 by adding an additional 24 hour subsistence only fishing period in District 3 from 6:00 p.m. Friday, June 30 until 6:00 p.m. Saturday, July 1.	Additional subsistence fishing time was requested by fishermen in District 3 in order to provide for their subsistence needs.
3-LY-18-89	June 30	Established gill net mesh size	A switch-over to gill nets of

<u>E.O. Number</u>	<u>Date</u>	<u>Action Taken</u>	<u>Comments</u>
		restriction of six inch or smaller for the taking of salmon for commercial purposes beginning 6:00 p.m. July 2 in District 3. Additionally, closed the commercial salmon fishing season in that portion of District 3 up river of the western edge of Great Piamut Island effective 6:00 p.m. Friday June 30.	six inch maximum mesh size directed commercial harvest toward summer chum salmon. Closure of that portion of District 3 upstream of the western edge of Great Piamut Island provided for increased subsistence fishing opportunity.
3-LY-19-89	July 2	Prohibited commercial fishermen from taking salmon for subsistence purposes by gill nets with mesh size larger than six inch maximum mesh size during commercial fishing periods restricted to six inch or smaller mesh size in District 3 beginning 6:00 p.m. July 2.	Action taken to prevent chinook salmon harvested under guise of subsistence from entering commercial markets.
3-LY-20-89	July 10	Closed that portion of District 3 not previously closed by E.O. 3-LY-18-89 effective 6:00 a.m. July 10.	District 3 closed because of deterioration of summer chum salmon flesh quality and to provide increased subsistence fishing opportunity although the chinook salmon harvest was below the guideline harvest range,.
3-LY-21-89	July 13	Closed the commercial fishing season effective 6:00 a.m. July 14 in District 1, and 6:00 a.m. July 13 in District 2.	Season closed in accordance with YUKON RIVER FALL CHUM SALMON MANAGEMENT PLAN to afford increased protection to the early portion of the fall chum salmon return.
3-LY-22-89	July 27	Opened commercial salmon fishing season effective 8:00 p.m. July 27 in District 1. Also established twice weekly	Sonar evaluation and test fishing and subsistence catch rates indicated a harvestable

<u>E.O. Number</u>	<u>Date</u>	<u>Action Taken</u>	<u>Comments</u>
		fishing periods, with gill nets of restricted mesh size, of 12 hour duration in the set net only area of District 1, and of six hours duration in the remainder of District 1.	surplus of fall chum salmon were available.
3-LY-23-89	July 30	Opened commercial fishing season effective 9:00 a.m. July 30 in Districts 2 and 3. Also established twice weekly fishing periods, with gill nets restricted to six inch maximum mesh size, of six hours duration in Districts 2 and 3.	Sonar evaluation and test fishing and subsistence catch rates indicated a harvestable surplus of fall chum salmon were available. Districts 2 and 3 periods opened concurrently to allow District 3 fishermen access to District 2 buyers.
3-LY-24-89	Aug 4	Established 24-hour subsistence fishing periods each weekend during the commercial salmon fishing season in Districts 1, 2, and 3 as follows: 12:00 noon Saturday until 12:00 noon Sunday in District 1, and 12:00 noon Friday until 12:00 noon Saturday in Districts 2 and 3.	Regulations require this action for the gill net area of Districts 1 and 2. The District 1 set net only area and District 3 were allowed additional subsistence fishing periods in response to significant reduction in commercial fishing period duration from prior years.
3-LY-25-89	Aug 13	Amended scheduled fishing periods for Districts 2 and 3 by increasing the amount of fishing time from 6 to 9 hours.	Based on harvest to date, sonar enumeration, and test net data, it was warranted to increase commercial fishing time.
3-LY-26-89	Aug 14	Amended scheduled fishing periods for District 1. Specifically increased fishing time in the set net only area from 12 to 16 hours and increased fishing time from 6 to 9 hours in the remainder of District 1.	Based on harvest to date, sonar enumeration, and test net data, it was warranted to increase commercial fishing time.

<u>E.O. Number</u>	<u>Date</u>	<u>Action Taken</u>	<u>Comments</u>
3-LY-27-89	Aug 17	Rescinded E.O. 3-LY-26-89 which increased commercial fishing time. Additionally, amended E.O. 3-LY-22-89 to void a single fishing period scheduled to occur from 8:00 p.m. Thursday, August 17 until 8:00 a.m. Friday, August 18 in the District 1 set net only area and from 9:00 a.m. Friday until 3:00 p.m. Friday, August 18 in the remainder of District 1.	Based on harvest to date, sonar enumeration, and test fishing data, it was warranted to delay commercial fishing to re-assess run strength and to assure a great enough portion of this run segment be allowed to pass the lower river area to provide for spawning escapement and upriver subsistence and commercial fisheries needs.
3-LY-28-89	Aug 20	Rescinded E.O. 3-LY-25-89 which increased the amount of fishing time during fishing periods established by E.O. 3-LY-23-89 for Districts 2 and 3.	Recent test fishing data indicated a harvestable surplus of fall chum and coho salmon to be present.
3-LY-29-89	Aug 21	Amended the fishing period scheduled by E.O. 3-LY-22-89 for District 1 on August 21-22 by extending fishing time four hours in the set net only area and three hours in the remainder of District 1.	Based on sonar and test fishing data a harvestable surplus of fall chum and coho salmon warranted increased fishing time.
3-LY-30-89	Aug 24	Amended E.O. 3-LY-22-89 to increase the commercial fishing time during the period scheduled on August 24-25 in District 1. The set net only area was extended four hours and the remainder of District 1 was extended three hours. In addition, this emergency order closed the commercial salmon fishing season effective 6:00 p.m. August 25 in District 1.	Fishery closed to ensure that the majority of fall chum salmon spawning area escapement objectives would be achieved, that subsistence requirements would be met, and that upper Yukon area commercial fisheries would have opportunity to achieve commercial harvest of similar proportion toward their respective guidelines.
3-LY-31-89	Aug 27	Amended E.O. 3-LY-28-89 to increase the amount of fishing time during the period scheduled on August 27 in	Fishery closed to ensure that the majority of fall chum salmon spawning area escapement

E.O. Number

Date

Action Taken

Comments

Districts 2 and 3 by 3 hours. In addition, this emergency order closed the commercial salmon fishing season effective 6:00 p.m. August 27 in Districts 2 and 3.

objectives would be achieved, that subsistence requirements would be met and that upper Yukon area commercial fisheries would have opportunity to achieve commercial harvests of similar proportion toward their respective guidelines.

ATTACHMENT 2. LIST OF UPPER YUKON EMERGENCY ORDERS, 1989

E.O. Number	Effective Date	Action Taken	Comments
UY-01-89	June 16	Delayed the opening of the commercial fishing season in District 6.	An attempt to conserve Tanana River chinook stocks and achieve chinook escapement goals out of the early portion of the run by delaying the opening of the District 6 commercial fishing season approximately two weeks.
UY-02-89	June 21	Established the commercial fishing season dates in subdistricts 4A, 4B, and 4C of District 4.	Based on reports from Yukon River subsistence fishermen, and data obtained from the sonar salmon counter at Pilot Station, both the chum and chinook salmon runs were well distributed and commercial harvest was justified.
UY-03-89	July 1	Reduced the allowable amount of commercial fishing time in sub-district 5-D of District 5.	To spread the commercial salmon harvest over a larger portion of the run, and allowed more timely and up-to-date monitoring of the commercial salmon harvest. The new weekly fishing periods conformed with the fishing schedule in the downstream portion of the district.
UY-04-89	July 6	Closed the commercial fishing season in Yukon River sub-districts 5-A, 5-B, and 5-C of District 5.	As of 7/6, the estimated cumulative commercial harvest was 2,000 chinook salmon. The guideline harvest range established for these subdistricts by the Alaska Board of Fisheries was 2,400 to 2,800 chinook salmon. Based on the estimated catch rates, the total harvest was expected to be 2,600 chinook salmon.
UY-05-89	July 13	Closed the commercial fishing season in Yukon River subdistrict 5-D of District 5.	Based on fish ticket catch data and verbal reports from fishermen, it was estimated that by 7/13, the cumulative commercial harvest in this subdistrict was approximately 400 chinook salmon. The guideline harvest range established by the Alaska Boards of Fisheries was 300-500 chinook salmon.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
UY-06-89	July 18	Closed the commercial fishing season in subdistricts 4-B and 4-C of Yukon River District 4.	The cumulative commercial chinook salmon harvest from District 4 based on fish ticket data and verbal reports from buyers was estimated to total approximately 2,800 chinook salmon by July 18. The guideline harvest range established for this district was 2,250 to 2,850. This harvest was larger than anticipated and required that the commercial fishing season in those subdistricts to be closed. Few chinook salmon were sold in Sub-district 4-A, and it was thought that a closure of that area would not have had an impact on the harvest of that species.
UY-07-89	July 23	Reopened the commercial fishing season in sub-Districts 4-B and 4-C of District 4.	On 7/18, the commercial fishing season in Yukon River subdistricts 4-B and 4-C of District 4 was closed because the chinook harvest level approached the upper end of the guideline harvest range established for the district. On 7/23 it was then estimated that the majority of the chinook run had passed through that district, and that summer run chums were still present in commercially harvestable numbers.
UY-08-89	August 1	Closed the commercial salmon fishing season in subdistricts 4-B and 4-C of District 4.	The summer chum salmon run was essentially over. Closure of the commercial fishery was warranted until an assessment of the strength of the fall chum run was made.
UY-09-89	August 6	Opened the commercial salmon fishing season in subdistricts 4-B and 4-C of District 4	Based on data from the lower Yukon test fishery, the sonar near Pilot Station, and on reports from subsistence fishermen in Districts 4 and 5, it was estimated that fall run chums were present in harvestable numbers and well distributed throughout the district.
UY-10-10	August 12	Opened the commercial salmon fishing season in subdistricts 5-A, 5-B, and 5-C of District 5 for one 24-hour period.	Fall run chums were well distributed throughout the lower portion of District 5 and appear to be present in commercially harvestable numbers. A limited opening of the commercial fishery was therefore warranted.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
UY-11-89	August 19	Opened the commercial salmon fishing season in subdistricts 5-A, 5-B, and 5-C of District 5 for one 24-hour period.	Fall run chums were present in District 5 since early August. A 24-hour opening of the commercial fishery on August 12, produced only 3,500 chum salmon; this indicated that salmon present in that area were a tightly integrated group which had migrated through those subdistricts by the time the period had opened. Indices of run strength from lower Yukon area suggest that the 1989 fall chum salmon run was of at least average strength and timing data suggests that fall chums were to be present in the lower subdistricts in Districts 5 by August 19.
UY-12-89	August 26	Opened the commercial salmon fishing season in subdistricts 5-A, 5-B, and 5-C of District 5 for one 24-hour period.	The total District 5 commercial harvest of fall chum accruing from two 24-hour fishing periods (August 12 and 19) was approximately 5,300 fish. Run strength, as assessed by the Pilot Station sonar, the lower Yukon test fishery, and lower Yukon commercial catch data suggest that the 1989 run was of at least average magnitude and that commercial harvest beyond the current level was justified.
UY-13-89	August 31	Opened the commercial salmon fishing season in subdistricts 5-A, 5-B, and 5-C of District 5 for one 24-hour period.	The total District 5 commercial harvest accruing from the three 24-hour fishing periods (August 12, 19, and 28) was approximately 15,400 fish. Run strength, as assessed by the Pilot Station sonar, the lower Yukon test fishery, and lower Yukon commercial catch data suggest that the 1989 run was of at least average magnitude and that commercial harvest beyond current catch level was justified.
UY-14-89	September 1	Opened the commercial salmon fishing season on the Tanana River in District 6 for one 24-hour period.	Based on available catch data from test fishwheels in Menley and Menana, fall chum run salmon were well distributed throughout the commercial fishing areas on the Tanana River. Because of uncertainty about run strength, the possibility of overharvest, and concerns for declining fall chum populations in the Toklat River, this period was 24 hours in length rather than the 42-hour commercial fishing period specified by the Board of Fisheries in the Tanana River Salmon Management Plan.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
UY-15-89	September 5	Opened the commercial salmon fishing season in subdistrict 5-D of District 5 for two 48-hour periods per week.	Test fishwheel catches at Ruby, subsistence and commercial fishermen catches in subdistricts 5-A, 5-B, and 5-C, escapement estimates from the Sheenjek and Chandalar River sonar projects, and strong, early catches in Canada, suggest fall chum salmon run strength was of at least an average magnitude. Based on the current available run timing information, it suggested that salmon were well distributed and sufficiently abundant throughout subdistrict 5-D to warrant opening the commercial season.
UY-16-89	September 8	Opened the fall commercial and subsistence/personal-use salmon fishing season on the Tanana River in District 6 for scheduled 42-hour period.	Based on Manley and Nenana test fishwheel catch data and the District 6 commercial harvest for the 24-hour opening on September 1, the Tanana fall chum salmon shown consistently strong, early run strength and appear well distributed throughout District 6. The Ruby subsistence fishermen catches indicated that Tanana fall chum salmon run strength was continuing to build. It was thought that the Tanana fall chum salmon run was sufficiently abundant to allow one 24-hour commercial period per week.
UY-17-89	September 12	Closed the commercial salmon fishing season in subdistrict 5-D of District 5.	The known commercial catch in subdistrict 5-D was approximately 3,300 fish. The commercial harvest of fall chum salmon in subdistrict 5-D had exceeded the guideline harvest range established by the Alaska Board of Fisheries (0 - 2000) and the projected harvest of 3,000 as published in the 1989 Upper Yukon Management Plan. The Upper Yukon fall chum salmon run was of average magnitude, therefore, a closure of the commercial fishery in this district was appropriate.
UY-18-89	September 12	Closed the commercial salmon fishing season in subdistricts 4-B and 4-C of District 4 of the Yukon area.	As of Friday, September 8, it was estimated that the cumulative 1989 commercial fall chum salmon harvest from subdistricts 4-B and 4-C was approximately 13,750 fish. This harvest was equal to nearly seventy-percent of the guideline harvest range established by the Alaska Board of Fisheries. Since the Yukon River fall chum run was of an average magnitude, and all known buyers for these subdistricts quit buying fish and were not planning to buy any fish from subdistricts 4-B and 4-C, a closure of the commercial fishing season was therefore appropriate.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
UY-19-89	September 28	Closed the commercial salmon fishing season on the Tanana River in District 6.	As of Tuesday, September 26, it was estimated that the cumulative 1989 commercial fall chum and coho salmon harvest from District 6 was in excess of 60,000 and 12,000 respectively. This was a record fall chum harvest, surpassing the 1985 record of 42,352 by over 40 percent, and greatly exceeding the guideline range of 10,250 fall chum and coho salmon combined. This large harvest was allowed based on the Board of Fisheries direction that the upper end of the fall chum/coho guideline harvest range could be exceeded if, in the judgement of Department biologists, escapement and subsistence requirements would not be compromised.

Attachment 3. Summary of special projects conducted in the Yukon Area, 1989.

1. LOWER YUKON TEST FISHING

a. Location:

- 1) Big Eddy Set Net Test Fishing Project: Kwikluak Pass near Emmonak (south mouth of the Yukon River Delta).
- 2) Middle Mouth Set Net Test Fishing Project: Kawanak and Apoon Passes middle and north mouths of Yukon River Delta).
- 3) Big Eddy Drift Test Fishing Project: Kwikluak pass near Emmonak (south mouth of the Yukon River Delta).

b. Objectives: To determine run timing, distribution and relative abundance of chinook, summer chum, fall chum and coho salmon in the lower Yukon River using gill nets.

c. Results:

- 1) Big Eddy and Middle Mouth Set Net Test Fishing Projects: Sites 1 and 2 combined catches.
 - a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated from June 4 to July 15. A total of 1,785 chinook and 9,296 summer chum salmon were captured. The mean date (the date on which statistically the central portion of the migration passed the test fishery) for both chinook salmon and summer chum salmon was June 18. The chinook salmon return appeared to be average in abundance. Relative abundance of summer chum salmon was similar to 1986 and 1988, both of which were strong returns.
 - b) FALL CHUM AND COHO SALMON: Index set nets for fall chum and coho salmon were operated from July 16 until August 28. A total of 2,555 fall chum and 2,099 coho salmon were caught. Fall chum salmon catches indicated an above average return, and were similar to 1983. Coho salmon test fishing catches indicated the run was about average in timing, and catches indicated a strong return. Test fishing data indicated mean dates of August 4 and August 17 for fall chum and coho salmon, respectively.
- 2) Middle Mouth Test Fishing Project: Site 3 catches.
 - b) FALL CHUM AND COHO SALMON: An additional index set net site for fall chum and coho salmon was fished from July 16 until August 28. A total of 2,347 fall chum and 685

coho salmon were captured. This site in Middle Mouth has been very effective in catching fall chum salmon and has been used since 1985. The cumulative season index of 97.8 was between the 1985 and 1987-1988 indices for this site. The mean dates of migration past this site were calculated to be August 12 and August 17 for fall chum and coho salmon, respectively.

3) BIG EDDY DRIFT TEST FISHING PROJECT:

Drift test fishing for chinook salmon was conducted for the third season in 1989. Two stations were established, one on each side of Kwikluak Pass upriver from the set net sites at Big Eddy. One drift was made at each station at approximately high tide. Data was collected from June 3 through June 29. A total of 378 chinook and 1,417 summer chum salmon were captured in a total of 104 drifts. Chinook salmon catches were similar to 1988, but significantly lower than in 1987. Summer chum salmon catches were higher than in 1988, and over three times as large as in 1987.

There did not appear to be a good relationship between drift and set net CPUE. It was difficult to interpolate data for drifts missed during commercial fishing periods. Both projects indicated similar run timing for chinook salmon.

2. UPPER YUKON RIVER TEST FISHING

a. Location:

1) Ruby Test Fish Wheel: North bank of Yukon River approximately 21 miles upstream from Ruby.

2) Manley Test Fish Wheel: North bank of Tanana River approximately 6 miles downstream of Manley Hot Springs.

3) Nenana Test Fish Wheel: North bank of Tanana River approximately 13 miles downstream of Nenana.

b. Objectives: To determine run timing and relative abundance of fall chum and coho salmon at the Ruby location. To determine run timing and relative abundance of chinook, summer chum, fall chum, and coho salmon at the Manley and Nenana locations.

c. Results:

1) Ruby Test Fish Wheel: The Ruby north bank test fish wheel was run from August 2 through September 12. During that time, a cumulative total of 3,116 fall chum

salmon were caught, with bimodal peaks occurring during the periods of August 19-23 and August 29 - September 6.

- 2) **Manley Test Fish Wheel:** The Manley north bank test fish wheel was operated from June 24 through September 28. The early season (chinook and summer chum) occurred from June 24 through August 8, with 742 chinook, of which 339 were jack chinook salmon, and 4,752 summer chum salmon captured. Chinook salmon peak passage occurred between July 4-21, while summer chum salmon passage was greatest from July 16 to August 4. The late season (fall chum and coho salmon) returns were very strong, and occurred from August 9 through September 28. A total of 14,343 fall chum and 1,096 coho salmon were captured. The fish wheel was operated only every other day beginning on September 14.
- 3) **Nenana Test Fish Wheel:** The Nenana north bank test fish wheel was operated from July 1 through September 28. The chinook and summer chum season occurred from June 24 through August 8. A total of 231 chinook, of which 43 were jack chinook salmon, and 3,422 summer chum salmon were captured. Chinook salmon harvests at the Nenana test fish wheel ranged from one to six fish throughout the season. Summer chum salmon catches displayed a normal distribution with the peak occurring between July 23 and August 3. The above average return of fall chum and coho salmon to the Tanana River was indicated by the Nenana fish wheel. The late season occurred from August 9 through September 28, with a total catch of 7,541 fall chum and 2,756 coho salmon. The fish wheel was operated only every other day beginning on September 14.

3. YUKON RIVER SONAR

- a. **Location:** River mile 123, approximately one mile upstream of Pilot Station. This sampling site has been used since 1985.
- b. **Objectives:** The primary objective of this project is to hydroacoustically estimate the number of salmon, by species, passing river mile 123.
- c. **Results:** Sonar was operational on both banks of the Yukon River between June 8 and September 11 in 1989. Fish counts totaled 2,794,328 of which 71% were detected migrating along the south shore and 29% were detected along the north shore of the river. Six mesh sizes of gill net were fished throughout the season to give data for development of species composition estimates. The program estimated passage of 79,362 chinook salmon, 1,622,331 summer chum salmon, 684,840 fall chum salmon, 174,631 coho salmon, and 233,109 other species. Apportionment of other species (primarily whitefish,

burbot, sheefish, and pink salmon) are not available.

4. SUBSISTENCE SALMON FISHERY SURVEYS

- a. Location: Yukon, Koyukuk and Tanana Rivers, Yukon Territory villages, and Yukon River Delta coastal communities.
- b. Objectives: Determine subsistence utilization of salmon and fishing effort for use in formulating future management procedures and goals.
- c. Results: An estimated 1,400 fishing households in the Yukon River drainage harvested approximately 59,435 chinook, 169,222 summer chum, 222,164 fall chum, and 41,510 coho salmon. Catch and effort information was obtained by personal interviews, permits, and catch questionnaires. Yukon Territory subsistence catch data was furnished by the Canadian Department of Fisheries and Oceans (DFO) (Whitehorse).

5. COMMERCIAL AND SUBSISTENCE SALMON CATCH SAMPLING

- a. Location: Emmonak, St Marys, Marshall, Galena, Rampart, Nenana, and Fairbanks.
- b. Objectives: Obtain age, sex, and size composition estimates for salmon harvests in the major commercial and subsistence fisheries on an in-season and post-season basis. Also, provide scale samples of chinook salmon to the stock identification research project for catch allocation to stock of origin based on scale patterns analysis. In addition, department crews assisted USFWS with collection of tissue samples from the District 1 commercial and test fisheries for genetic stock identification studies (GSI).
- c. Results: Approximately 4,300 chinook salmon, 4,500 summer chum salmon, 2,800 fall chum salmon, and 750 coho salmon were sampled from fishery harvests in 1989. Preliminary age and sex composition estimates for the lower river commercial fishery were obtained on an in-season basis for management purposes. Samples from upper river fisheries were aged on a post-season basis. Overall age compositions by species were as follows:
 - 1) Chinook salmon: 0.3% age 3, 5.8% age 4, 32.2% age 5, 51.9% age 6, 9.0% age 7, and 0.8% age 8 fish.
 - 2) Summer chum salmon: 0.5% age 3, 41.2% age 4, 57.6% age 5, and 0.7% age 6 fish.
 - 3) Fall chum salmon: 1.1% age 3, 85.8% age 4, 12.8% age 5, and 0.3% age 6 fish.
 - 4) Coho salmon: 19.2% age 3, 76.3% age 4, and 4.5% age 5 fish.

6. CHINOOK SALMON STOCK BIOLOGY

- a. Location: Commercial and subsistence fishery catch samples were obtained from Districts 1, 2, 4, 5, and 6, and test fishery catch samples were obtained from District 1. Escapement carcass samples were collected from the Andreafsky, Anvik, Chena, and Salcha Rivers in Alaska, and from the Big Salmon, Little Salmon, Tatchun (Creek), Ross, Wolf, Morley, Swift, and mainstem Yukon Rivers in Yukon Territory. Samples were primarily collected from carcasses. However, some samples were obtained from live fish captured for a GSI study conducted by the USFWS. Additional catch and escapement samples from the Yukon Territory were provided by the Canadian Department of Fisheries and Oceans (DFO).
- b. Objectives: Allocate Yukon River commercial and subsistence chinook salmon harvests to stock region of origin by fishing district and time period based on scale patterns analysis. Assess the quality of spawning escapements relating to potential productivity, and monitor the effects of harvest management strategy on spawning escapements by stock.
- c. Results: All escapement samples, and catch samples not aged during the season, were aged on a post-season basis. Age, sex, and size composition data are compiled, and are preliminary. Scale patterns from approximately 2,000 chinook salmon catch and escapement samples were analyzed using a computer based digitizing station. These scale measurements will be used to build stock identification models for allocation of the Yukon River fishery harvests to stock region of origin.

7. ANVIK RIVER SALMON ESCAPEMENT STUDY

- a. Location: River mile 48 of the Anvik River.
- b. Objectives: Enumerate summer chum salmon escapement to the Anvik River on a daily basis using side-scanning sonar. Collect chum and chinook salmon samples by beach seine for age, sex, and size composition estimates. Additional chinook salmon samples were collected by carcass survey under the Chinook Salmon Stock Biology Project.
- c. Results: Salmon escapement counting was conducted from June 18 through July 26. The season total escapement estimate was 636,906 summer chum salmon (30% above the escapement objective of 487,000 fish). However, the estimate was 59% less than the parent year escapement 1985 of 1,080,243, and 17% below the long-term (1979-1988) sonar escapement average of 768,531 fish. The 1989 commercial harvest of 899,171 summer chum salmon in the Lower Yukon Area was 49% greater than the 1985 harvest of 438,173 salmon. The increased

1989 harvest most likely was the major cause of the decrease in escapement numbers of summer chum salmon in the Anvik River over the parent year escapement.

Chum salmon age composition for 588 ageable samples was 61% age 5, 38% age 4, 1% age 3, and a trace age 6. Females accounted for 66% of the sample. Unlike previous years, sample percentages for summer chum salmon were weighted by time period and escapement counts. Chinook salmon age composition for 381 ageable samples was 49% age 5, 44% age 6, 5% age 4, and 3% age 7. Females accounted for 41% of the total sample.

8. DISTRICT 4 SUMMER CHUM SALMON HARVEST STUDY

- a. Location: Subdistrict 334-41 (4A) of the Yukon Management Area.
- b. Objectives: Determine the number of summer chum salmon harvested in District 4 during the summer commercial season based on the reported harvest of salmon roe, the mean weight of the salmon roe skeins, and the sex ratio of the harvest.
- c. Results: An estimated 506,240 summer chum salmon were harvested in District 4 during the 1989 summer season. Based on an estimated roe weight per female of 0.90 lb, 316,222 female summer chum salmon were harvested to produce the reported harvest of 283,305 pounds of roe. Subdistrict 4A accounted for 95% of the District 4 roe harvest and estimated total numbers of summer chum salmon removed. Average roe weight per female was greatest from salmon harvested by gill net and delivered to Anvik-area processors, 0.98 lb/female salmon, while the lightest roe weight per female was obtained from fish wheel-harvested salmon delivered to Nulato- or Galena-based processors, 0.87 lb. Subdistrict 4A fishermen sold approximately 62% of the reported roe harvest to Nulato- or Galena-based processors. Salmon roe from fish wheel-caught fish comprised 82% of the Subdistrict 4A harvest.

Less than 4% of the total estimated number of salmon harvested in District 4 during 1989 were sold in the round. An estimated 171,506 male summer chum salmon were harvested in the District 4 fishery but not sold.

9. SHEENJEK RIVER ESCAPEMENT STUDY

- a. Location: River mile 6 of the Sheenjek River (Porcupine River drainage).
- b. Objectives: Determine timing and magnitude of salmon escapement to the Sheenjek River and collect salmon age, sex, and size information from a sampled portion of the run.

- c. Results: The sonar-estimated escapement to the Sheenjek River in 1989 was 81,748 fall chum salmon for the period August 24 through September 25. However, an additional 20,000 chum salmon were estimated present in the river prior to initiation of sonar operations based upon an aerial survey of the river on August 22. The mean date of run passage was September 5. Thus, the total estimated escapement to the river in 1989 was 101,748 fall chum salmon.

Preliminary results from aging vertebrae indicated the overall age composition of the 1989 Sheenjek River fall chum salmon run to be approximately 5% age 3 fish, 77% age 4 fish, 17% age 5 fish, and 1% age 6 fish. Fall chum salmon samples were also collected for subsequent analyses in support of on-going genetic stock identification studies.

10. CHANDALAR RIVER ESCAPEMENT STUDY
(Conducted by U.S. Fish and Wildlife Service)

- a. Location: River mile 13 of the Chandalar River.
- b. Objectives: Determine timing and magnitude of salmon escapement to this river, and collect salmon age, sex, and size information from a sampled portion of the run.
- c. Results: The sonar-estimated escapement to the Chandalar River in 1989 was 69,161 fall chum salmon for the period August 10 through September 29. Although most salmon were oriented nearshore, the estimate is considered conservative as counts do not include fish passing in the un-ensonified zone. Further, fish were present before and after sonar equipment was in operation. Although the 1989 run was bimodal in nature, peak daily passage occurred on August 18.

An estimated 20,232 chum salmon were observed in a helicopter survey of the river between the sonar site and confluence of the East Fork Chandalar River on September 19, representing approximately 29% of the sonar-estimated escapement.

Aging of vertebrae samples collected indicated the overall age composition of the Chandalar fall chum to be approximately 4% age 3 fish, 70% age 4 fish, 21% age 5 fish, and 5% age 6 fish. Fall chum salmon samples were also collected for analysis for use in ongoing genetic stock identification studies.

11. TANANA RIVER FALL CHUM SALMON ESCAPEMENT STUDY

- a. Location: Tanana River, upstream of Fairbanks
- b. Objectives: 1) Determine spawning location of fall chum salmon in

catches.

- c. Results: It was not possible to obtain a herring biomass estimate based on aerial surveys due to turbid water conditions during 1989. Evaluation of herring spawn deposition, test fishing data, and age composition data from test and commercial catches resulted in an in-season herring biomass of 4,400 st. Department test fishing was conducted from May 22 to June 3. A total of 2,003 herring were caught, of which 451 samples were used for test fishing data. The remainder of the fish captured were sampled as part of a stock identification study. A sample of 866 herring was taken from the commercial catch. Approximately 20% of the total biomass was composed of age 8 herring. Age 9 and older herring comprised 54% of the biomass. Recruits, age 3, 4, and 5 herring, represented 9% of the biomass. Ground surveys indicated spawn deposition occurred from May 24 until at least termination of the project. Heavy snowfall, cold temperatures, and a large amount of ice in Kokechik Bay affected the timing of spawning.